Teacher Practices in Primary Schools with High Value-Added Scores and Engaging Lessons in Disadvantaged Communities in Rural Mexico

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Abstract

This mixed methods research uses econometric analysis and thematic analysis to identify the practices of teachers, in a selected sample of disadvantaged schools in Mexico with high value-added scores and engaging lessons. In the first chapter, a review of the literature is conducted to explore the definition of student engagement, determine the factors that facilitate it, and examine its relevance for achievement. As a result of the review, student engagement was defined in the research as a metaconstruct with cognitive, behavioural and emotional components. The review revealed that student engagement is influenced by home and personal factors, school factors, and classroom factors. Among the latter, the literature provides evidence that teachers' practices play a major role in promoting student engagement, and teachers act as mediators between student engagement and achievement. The second chapter examines the design and methodology of the research.

The final four chapters investigate whether the schools in the sample fit the theoretical proposition of the research, that there are marginal primary schools in Mexico, where students outperform their peers on the national standardized test, due to the teachers' ability to engage students; and investigate what those practices in the selected schools are. Results from a random effects model, which used data from 315 6th-grade students in 18 schools, revealed a positive and significant correlation between student engagement and teacher practices, clarity, academic press, academic personalism, trust, and rigour; and the variables parental support and teacher qualification.

Results from a multiple case study conducted in two of the 18 schools, and where students reported relative high levels of student engagement, corroborated the importance of the practices, academic personalism, trust, academic press, and parental involvement. In addition, school leadership, discipline, and the students' exposure to fun and creative lessons delivered by an enthusiastic teacher, were also found to be promoters of student engagement. The difficult socioeconomic background of the students and lack of incentives for the teachers, were found to be challenges to student engagement.

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INTRODUCTION TO THE STUDY

According to the results of the Programme for International Student Assessment (PISA), between 2003 and 2012 Mexican students had an average increase of 3.1 score points per year on the Mathematics assessment, which was the third highest increase among OECD countries (OECD, 2013a). Despite this outstanding improvement (also in 2015), more than half of Mexican students performed below the baseline level of proficiency in Mathematics and less than 1 per cent were considered top performers. At its current pace of improvement, it is estimated that it will take over 25 years for the country to reach the 2012 average OECD levels in Mathematics, and 65 years in Reading (OECD, 2013b; OECD, 2015).

The improvements are largely the result of progress among disadvantaged and low-performing schools, due to initiatives aiming to support underprivileged students, such as the National Education Development Council Programme which proved to narrow the gap in Mathematics scores in primary schools, and in Language in secondary education (UNESCO, 2014). However, the capacity of the country to provide disadvantaged students with the opportunity to perform at a high level is still very limited. This is evident as only 13 per cent of disadvantaged students in Mexico were identified in PISA 2015 as high performers despite their socioeconomic background, compared with the average of 29 per cent across OECD countries (OECD, 2015).[1]

In addition to the poor performance, Mexico also faces a substantial challenge given the low participation rates of students at the secondary level. According to the Secretariat of Public Education (SEP), for the school year 2015–2016, the net enrolment in upper secondary was 59.5 and the completion rate was 58.1, while for lower secondary the net enrolment was 87.5, and the completion rate was 93 (SEP, 2015).

Despite the initial focus of researchers in the developed world on the importance of school-level inputs to improve learning outcomes, from the early 2000s educational effectiveness research has provided rich evidence that teacher effects greatly exceed school effects when

[1] A student is classified in PISA as resilient (i.e. high performer despite his/her socieconomic background) if he or she is in the bottom quarter of the PISA socioeconomic index and performs in the top quarter of students from all participant countries, after accounting for socioeconomic status.

progress over time is studied (Clotfelter, Ladd, & Vigdor, 2006; Hanushek & Rivkin, 2006; Muijs & Reynolds, 2010). Despite this evidence, there is still considerable debate on the specific aspects and characteristics of teachers that are important to improve educational outcomes.

For instance, the evidence suggests that traditional observable teacher characteristics, such as experience and qualifications do not explain variations in student scores. Contrarily, recent research suggests that aspects such as subject knowledge, self-efficacy, supporting lesson climate, and intellectually challenging teaching, are good predictors of student achievement (Marzano, 2007; Reynolds, 2014). Despite this evidence from the developed world on the importance of teacher characteristics and practices, research in Mexico has focused mainly on investigating the impact on attainment of school-level factors, such as school climate, school autonomy, instructional time, and infrastructure (Caso, Chaparro, Díaz, & Urias, 2012; García & Martínez, 2013; Vegas & Petrow, 2007).

Given the gap in the literature in Mexico and more generally in Latin America, on the specific teacher practices that promote better educational outcomes for their students, this research focuses on the teachers' classroom practices that promote student engagement. The reason this study focuses on studying teacher practices as related to engagement is because empirical research from the developed world has repeatedly confirmed that student engagement, mediated by teachers' practices, has a positive impact on high school completion and achievement in the long run (Skinner & Belmont, 1993; Klem & Connell, 2004; Decker, Dona, & Christenson, 2007; Finn & Zimmer, 2012).

It is thought that the evidence from the developed world, on which this research is based, could inform this study which was conducted in Mexico, because research from developing countries, although scarce, suggests the same pattern of results on engagement as the literature from the developed world (Teodorovic, 2011; Kingir, Tas, Gok, & Vural, 2013). In addition, this research focuses on the study of teacher practices and engagement, because unlike other determinants of school success, such as parental involvement and socioeconomic background, these factors could be altered through school-based interventions, making the results relevant for policy makers working in education.

Furthermore, some research indicates that students in Mexico (and in fact in some other countries in Latin America) are relatively disengaged. For instance, Bruns and Luque (2014) who used nationally representative samples from Colombia, Honduras, Jamaica, Peru, and from some states in Brazil and Mexico, between 2009 and 2013, to investigate the relationship between classroom practices and student learning, found that students in the sample were disengaged, and that 'poor student learning results can be directly and strongly linked to the failure of teachers to keep students engaged' (p.120).

Having this evidence in mind, and with the aim to investigate pathways towards greater equality in education, I designed and conducted a mixed methods study to identify engaging teacher practices in a sample of outstanding schools, serving disadvantaged students in the state of Hidalgo, Mexico. The research is based on the theoretical proposition that there are marginal primary schools where students outperform their peers on the national standardized test, due (among other factors) to the teachers' ability to engage students with academic tasks.

In order to conduct the research I identified 18 marginal schools/classrooms with positive value-added scores to investigate whether or not the theoretical proposition holds. The research seeks to answer three research questions. The first one enquires about the engagement level of students in the selected classrooms. This question is crucial because only after knowing the engagement levels, was worth asking questions number two and three regarding the specific factors that might promote such engagement. The second research question asks what are the teachers' practices and school characteristics that promote student engagement in the 18 selected classrooms, as reported by the students. The third question also enquires about the teacher practices that promote engagement, but focusing on two classrooms where students show relative high levels of cognitive, behavioural, and/or emotional engagement.

The study collected quantitative data from a survey applied to the 315 6th-grade students of the 18 schools. This survey gathered data from students on their level of engagement and the practices of their teachers. In addition, a multiple case study was conducted to collect qualitative data on teacher practices, from the teacher, principal and students of two schools where students reported relative high levels of student engagement.

Quantitative data was analysed using a random effects model to investigate the relationship between engagement and a set of individual and school-level variables (which include teacher practices). Then, qualitative data was examined using thematic analysis to establish whether the variables included in the econometric model were relevant for the participants of the case studies, and to identify themes emerging from the data which were not anticipated at the beginning of the study.

Although the non-representative selection of schools and the very limited number of case studies do not allow claims of causality and limit the generalizability of the findings, this research can potentially inform policy on the key teacher practices that are producing the positive results in the selected schools, and illuminates the practices that should be covered in teacher education and training. The results also inform on the parental inputs and aspects of the family background that were key in determining pupil outcomes in these schools, and raises questions for future research on how schools in disadvantaged areas should interact with families. The research also contributes to the discussion on the importance of gathering data on student engagement.

The thesis comprises seven chapters. **Chapter 1** examines the literature relating to the construct of engagement. The review discusses the different theoretical approaches to engagement, explores several definitions of engagement (paying special attention to the conceptualizations of behavioural, cognitive and emotional engagement), and examines the factors that facilitate engagement, as well as its outcomes. **Chapter 2** focuses on the methodological rationale of the research. In this chapter, I discuss the theoretical perspective of the research, the research questions, and the strategy and design of the research through the description of five research phases. This chapter also examines ethical considerations as well as aspects related to access to the data, and the limitations of the research. **Chapters 3 and 4** discuss the collection of quantitative data and present the results that enabled the first and second research questions to be answered; and **Chapters 5 and 6** address the collection of qualitative data and present the results from the case studies. In **Chapter 7**, I conclude the thesis by summarizing the key findings, and discussing the implications for policy and future research.

CHAPTER 1: LITERATURE REVIEW

Although there is consensus that teacher quality is the most significant institutional determinant of academic success (Sanders & Rivers, 1996; Rivkin, Hanushek, & Kain, 2005), there is considerable debate regarding the specific aspects of teaching that play a crucial role in improving the learning outcomes of the students. This literature review aims to investigate the teacher practices that have been shown to be important in facilitating student engagement and consequently student achievement. It focuses particularly on research that seeks to understand the teacher practices that contribute to improved engagement and educational outcomes of underprivileged students.

Specifically, the review is guided by one of the research questions, which asks: *What are the practices of teachers in the selected classrooms where students show relatively high levels of cognitive, behavioural and/or emotional engagement that may be promoting such engagement?* Hence the focus is on the concept of engagement, the teacher factors that influence it, and its measurement. Although I recognize there are other crucial factors influencing engagement, such as leadership and parental support, given the focus of the research question they are not discussed in depth in this review.

The review of the evidence also revealed that the construct of engagement has been rarely examined in the context of developing countries. Although several studies show that in developing countries school-level variables explain between two and three times more variance in achievement than in industrialized countries, there is still a limited literature on the factors that contribute to improving the learning outcomes of students at the school and the classroom level in these contexts (Heyneman & Loxley, 1982; Velez, Schiefelbein, & Valenzuela, 1993). For this reason, this review necessarily focuses largely on evidence from the developed world.

The literature review is divided into three sections. The first section provides a chronological timeline of the evolution of the construct of engagement, the second section reviews the definition of engagement as a metaconstruct, and the third section examines the factors facilitating student engagement. In this section, special attention is placed on analysing the

role of *teachers*. Specifically, empirical evidence will be presented on the link between teacher practices, student engagement and academic achievement.

SECTION I – The Construct of Engagement

This section provides a chronological account of the evolution of the construct of engagement, starting with the classic literature and moving forward to the most recent conceptualizations. By exploring the origins of the construct, it is possible to understand the different approaches used by scholars to study engagement, and frame the research in the theoretical approach that best fits the research questions.

As will be evident, the literature on engagement mainly comes from the Psychology field and focuses on the individual (i.e. on students and on how teachers influence student engagement). Within the Psychology field there are two major lines of research. The first one emphasizes the importance of the context in promoting engagement (i.e. the school), and the second one emphasizes the importance of interpersonal dynamics (i.e. the interaction with teachers) mainly in the classroom context. Both approaches are considered here.

The review also revealed the need to adopt the view of engagement as a metaconstruct, which groups the multiple dimensions of engagement suggested by scholars from different lines of research. Lastly, what is also evident is the lack of convergence between the literature on engagement and other literatures, which might explain student engagement and achievement, such as that on teacher effectiveness, leadership, and school organization. These issues are discussed further below.

Classic literature

The first efforts to develop the concept of *school engagement* came in response to a common concern among academics regarding school dropout rates and students' alienation. In the early work, school engagement was understood as the most promising approach for interventions to help increase completion rates. With this understanding a first set of models, grounded in *engagement theory* and emphasizing the importance of the context to promote engagement, were developed.

The pioneer of these models was Newmann (1981) who argues that in order to reduce student alienation, schools could increase the involvement-engagement of their students by facilitating student participation in classroom work and in school governance. The author notes that in order to increase the engagement of their students, schools could also keep the school size small, encourage civil relationships and cooperation between peers and school staff, provide an authentic curriculum, and maintain clear and consistent educational goals.

Similarly, Wehlage, Rutter, Smith, Lesko, and Fernandez (1989) argue that school setting mediates student engagement. They analysed 14 secondary schools with programmes reputed to be effective in preventing students from dropping out, and conclude that effective schools provide students at risk with a community support with which students can identify and where they can be involved in academic endeavours. They also developed a theory of dropout prevention for students at risk, which states that both student problems and socio-cultural conditions affect school membership and educational engagement, and that this in turn impacts academic performance.

A decade after their first approach to engagement, Newmann, Wehlage, and Lamborn (1992) provided one of the early definitions on student engagement. Given the importance of contextual factors to enhance student participation, they referred to student engagement as related to *school membership*, which they described as the student's perception of the school as being a place where they have a clear educational purpose, where they receive fair treatment and personal support in their challenging enterprises, and where they could experience success and feel they are worthy and valuable members.

The authors note that a student who is engaged is in contrast to a student who has superficial participation, apathy and lack of interest. Thus, they suggest that student *engagement in academic work* refers to 'the student's psychological investment in and effort directed toward learning, understanding, or mastering the knowledge, skills or crafts that academic work is intended to promote' (p.12). They also state that there is a clear difference between this effort and the simple commitment to complete mandatory work, which may produce good grades but does not imply that the student is engaged in mastering a topic.

In addition, they claim that in order to promote engagement, school work should be considered by students to be 'meaningful, valuable, significant, and worthy of one's effort' (ibid., p.23), and described this concept as *authentic work*. Thus, they suggest that student engagement increases when students experience the mastery of schoolwork, when they find work to be interesting and fun, and when they have a sense of ownership for their work, and think it is connected to the real world.

Other authors propose models grounded in *psychological motivation theory*. The most prominent model using this approach is the *self-system process model* developed by Connell and Wellborn (1991). The model is based on the belief that a person has an appreciation of the self in relation to an activity that leads him or her to estimate whether or not his or her basic needs of competence, autonomy and relatedness are met.[2]

Connell and Wellborn suggest that these processes of appreciation develop within an individual throughout the lifespan and are influenced by the interactions with others. They claim that engagement or disaffection are the results of self-system processes and can be followed by the development of skills and social behaviour (see also Skinner, Kindermann, & Furrer, 2009).[3] Thus, schools that are able to provide students with these basic needs have higher levels of student engagement (Connell, Spencer, & Aber, 1994). More recently, and in line with the *self-system process model*, Skinner and Pitzer (2012) proposed a model grounded in the self-determination theory, which emphasizes the importance of social contextual features in facilitating the emergence of intrinsic motivation to engage students in academic tasks.

Combining both the contextual and interpersonal views on engagement described above, Finn (1989) developed the *participation–identification model*, which describes student disengagement as the consequence of a cumulative lack of participation and psychological

[2] The authors state that students have a feeling of being *competent* when they are able to achieve desired goals after receiving instrumental support from their teachers (e.g. when teachers convey high expectations or adjust the teaching strategies to better support students); that students' needs for *autonomy* are met when teachers provide the freedom required for students to be able to decide on their own behaviour; and that needs of *relatedness* are met through good quality relationships with both peers and teachers (e.g. when the teacher expresses affection towards the student, enjoys the interaction, and spends time and resources with him or her).
[3] The authors conceptualize engagement as the intensity of the involvement that a child uses in starting and developing learning activities.

identification with school. Finn suggests that successful students develop a sense of *identification* with school (contextual view), which is understood as an internalized conception of belongingness. He states that students materialize this conception when they feel that they are significant members of the school community, and think that school is an important part of their own self-view (Finn & Zimmer, 2012).

In addition, Finn states that the most successful students also engage in some particular forms of *participation* in school and classroom settings (interpersonal view). At the most basic level of participation, students respond to the requirements of the teacher and the curriculum, such as attending class, and not engaging in disruptive behaviour. Later, participation efforts are characterized by going beyond the minimal requirements (e.g. spending extra time on classroom related activities or sports). At the highest level of participation, students are involved in school governance, where they may play decision-making roles.

The importance of school *participation* and *identification* for the performance of students at school has been well documented in the literature. Research on school participation has focused on the importance of factors such as attendance, disruptive behaviour, inattentiveness, and time on task, among others. For example, Finn, Pannozzo, and Voelkl (1995), studying the relation between teachers' ratings of the classroom behaviour of 4th-graders and student achievement, find that the measures of effort, initiative taking and inattentive behaviours are correlated with achievement in test scores. Similarly, Voelkl (1997) finds a positive relationship between achievement and feelings of identification. In fact, prior to the definition of the model by Finn, other authors such as Liska and Reed (1985) (from the sociology field) hypothesized that identification with conventional institutions, including the school, serves to inhibit misbehaviour (Finn & Zimmer, 2012).

Other pioneers on engagement include Birch and Ladd (1997), who propose that the degree of warmth and open communication between teachers and students (closeness), the overreliance on the teacher as a source of support (dependency), and the lack of harmonious relations between students and teachers (conflict), were related to the pupil's school adjustment and engagement. Empirical evidence provided by the authors supports the idea that dependency in teacher–child relations was correlated with less positive school engagement, that closeness was positively correlated with engagement, and that both

closeness and less dependency accounted for a significant portion of the changes in language skills.

Recent views on student engagement

As is evident from the theoretical perspective explained above, school engagement is described as having multiple components and coming from different lines of research. As a way to bring together these separate lines of research, under one conceptual model, researchers have begun to understand engagement as a metaconstruct. Although the different terminology used in recent literature makes comparison difficult, behavioural, emotional and cognitive dimensions appear repeatedly as part of the construct, and are seen as highly intercorrelated. In addition, the literature shows that scholars have changed the focus on dropout prevention, and are becoming more interested in the role of school engagement in relation to student achievement.

Jimerson, Campos, and Greif (2003) made the first effort to bring together the multiple definitions and measures of engagement. After conducting a literature review on engagement, they suggest that school engagement is a multifaceted construct, which includes affective, behavioural, and cognitive dimensions. They note the literature primarily measured engagement using indicators of behaviours (e.g. participation in extracurricular activities and rate of homework completion) and emotions (e.g. feelings about the school, teachers and peers, and perceptions and beliefs related to the self, such as self-efficacy and motivation). Although they consider engagement as a metaconstruct, they do not include indicators of cognitive engagement.

One year after this first review, Fredricks, Blumenfeld, and Paris (2004) published a major review of the literature, which analysed the definitions, measures, precursors and outcomes of engagement. They describe engagement as having multiple components, and define it as a metaconstruct, which includes behavioural, emotional and cognitive dimensions.[4] They suggest the *behavioural* dimension refers to the students' involvement in learning and

[4] They suggested that the routes to student engagement may be academic or social and can stem from opportunities in the classroom (or school) for participation, intellectual challenges and interpersonal relationships.

academic tasks, participation in school-related activities, and having positive conduct. The *emotional* dimension is related to the students' identification with school, and their affective reactions such as interest, boredom, happiness, and anxiety. The *cognitive* component comprises the students' psychological investment in learning and the use of strategies for learning.

Following the approach of Fredricks and colleagues, and based on the results from the interventions *Check & Connect* (discussed in Chapter 1, section 3), Appleton, Christenson, Kim, and Reschly (2006) propose a conceptualization of engagement, which includes four subtypes of engagement, namely: academic, behavioural, cognitive and psychological. They claim that *academic* engagement refers to the students' time on task, and credits earned towards graduation, while *behavioural* engagement refers to attendance and participation in extracurricular activities. They also argue that both *cognitive* and *psychological* engagement refer to more internal indicators, which include self-regulation, personal goals, autonomy and relationships with teachers.

Following a similar path, Darr, Ferral, and Stephanou (2008) proposed a conceptualization of student engagement that includes a behavioural, emotional and cognitive dimension and which focuses on the students' overall perceptions about their connection with school and the learning environment. Similarly to the conceptualizations described above, they suggest that *behavioural* engagement refers to the students' actual participation in school and learning. This includes observable behaviours such as positive conduct and involvement in school life. They referred to *affective* engagement as the students' emotional responses to learning, school, teachers and peers. *Cognitive* engagement is related to the investment in learning and going beyond the requirements (See also Darr, 2012).

Likewise, Libbey (2004) conducted a literature review in order to clarify different indicators used by scholars to measure school *connectedness*. The author suggests that students' participation in extracurricular activities and involvement in decision-making roles are commonly referred to in the literature as indicators of *behavioural* engagement. Students' sense of belonging, positive perceptions of their relationships with peers, school discipline and fairness, as well as the extent to which students report feeling safe at school were commonly used in the literature as indicators of *affective* engagement. Indicators of *cognitive*

engagement were linked to the student's motivation to learn (see also Luckner, Englund, Coffey, & Nuno, 2006).

Complexities of reaching a consensus

Having a clear understanding of what is considered *engagement* was of paramount importance in this research; however, adhering to one of the definitions was not an easy task. The first concern was that the literature has conceptualized engagement using different terms, such as school engagement, student engagement, school involvement, engagement in schoolwork, and academic engagement, among others. Most importantly, the definitions are often broad. This is problematic as they encompass a wide range of behaviours and feelings (ranging from liking the school to participating in sports) which makes it seem that almost any intervention is an intervention to increase engagement.[5]

There is also a lack of differentiation between different types of engagement. For instance, some authors have included, at the same time and in all types of engagement, dimensions such as investment, participation, attachment, emotion and motivation, creating an overlapping and confusing definitional spectrum. For instance, the term *effort* is included as part of the definition of both cognitive and behavioural engagement, and sometimes there is no distinction, for example between the *effort* aimed to fulfil behavioural expectations, such as attending class, and the *effort* aimed at mastering the content (Fredricks et al., 2004).

There is also a lack of consistency in the literature between the indicators and outcomes of engagement. For example, some authors include *scores in achievement tests*, and *beliefs related to the self* (such as self-efficacy and expectations) as both indicators and outcomes of engagement (Jimerson et al., 2003; Sinclair, Christenson, Lehr, & Anderson, 2003). Other indicators are extremely difficult to measure, such as *personal goals*, used in the research by Appleton et al. (2006). Other authors use broad definitions, including indicators such as boredom, anxiety, safety and liking school, that are not widely accepted (Finn & Zimmer, 2012).

[5] That is the case of the definition provided by Libbey (2004), according to whom *academic engagement* is the 'extent to which students are motivated to learn and do well in school' (p.279).

Despite the lack of clarity in these major aspects, scholars show general consensus regarding some important facets. First, engagement is broadly considered as the main theoretical model to understand school dropout and to promote school completion. Second, regardless of the definition, student engagement is associated with better academic, social and emotional outcomes. Third, researchers understand engagement as a multidimensional construct (although, scholars have not yet reached an agreement over the number and types of engagement dimensions). Finally, engagement is not conceptualized by scholars as an attribute of the student, instead it is considered as an 'alterable state of being that is highly influenced by the capacity of school, family, and peers to provide consistent expectations and supports for learning' (Christenson, Reschly, & Wylie, 2012).

SECTION II – Student Engagement as a Metaconstruct

Given the consensus in the literature that student engagement is a multidimensional construct, and taking into consideration that this approach provides a richer characterization of students' experiences, engagement in this research is understood as a metaconstruct, with cognitive, behavioural and emotional components. However, given the need to select a definition to be used as a theoretical framework for the research, this section explores further the multiple conceptualizations of these subtypes of engagement. Adopting a definition also meant choosing an instrument to measure engagement that was in line with the theoretical approach. At the end of the section the theoretical perspective adopted as well as details on the measurement of engagement are presented.

Cognitive engagement

Although, scholars only recently began to describe engagement as a metaconstruct with multiple dimensions, the study of those dimensions started even before the first conceptualization of school engagement. In the late 1970s some authors suggested that a major weakness of the research paradigms of the time, was that studies focused only on student behaviour (such as time on task), while ignoring the students' covert responses during instruction. For the scholars at the time there was a need to define more precisely the cognitive processes that were operating during learning (Winne & Marx, 1977; Doyle, 1978; Tobias, 1982).

One of the pioneering studies on cognitive engagement was conducted by Peterson, Swing, Braverman, and Buss (1982), who studied Mathematics learning among 5th-graders and found that the students' reported cognitive processes were related to ability and achievement. Given that the results from this research could not be generalized, in 1984, Peterson, Swing, Stark, and Waas, replicated the study and found that internal cognitive processing mediates the relationship between instruction and achievement. From these first studies that confirmed the relationship between cognitive engagement and achievement, other scholars started to investigate cognitive engagement as a separate dimension from the behavioural and emotional dimensions.

Researchers who based their work on engagement theory, stress the fact that cognitive engagement relates to the student *investment* in learning. For example, Newmann (1992) states that 'engaged students make a psychological investment in learning. They try hard to learn what school offers. They take pride not simply in earning the formal indicators of success (grades), but in understanding the material and incorporating or internalizing it in their lives' (p.3). More specifically, they suggest that *academic engagement* is the 'student's psychological investment in and effort directed toward learning, understanding, mastering the knowledge, skills or crafts that the academic work is intended to promote' (ibid., p.12).

Newmann and colleagues also note that engagement is a construct used to describe an inner quality of concentration and effort to learn. Therefore, student investment in academic work should be viewed as a process, and not as a state of being engaged or disengaged. They suggest engagement should be inferred from indirect indicators that account for 'the amount of participation in academic work, the intensity of student concentration, the enthusiasm and interest expressed, and the degree of care shown in completing the work' (ibid., p.13). However, they also claim that indicators referring to these aspects can be misleading because they may represent the compliance of students with school norms, and not their interest in comprehending and learning (see also Wehlage et al., 1989).

A second line of research comes from authors who base their work on motivation theory. This theory is fundamentally concerned with the 'psychological processes that underlie energy, purpose and durability of human action' (Skinner & Pitzer, 2012, p.22). One of the most prominent studies using this theoretical framework is the work of Connell and Wellborn

(1991). They suggest that motivational approaches tend to view the social context as a means to facilitate or inhibit the development of the self. Among the facilitating aspects, they included the 'channeling of motivational energies toward culturally acceptable enterprises' (p.48). Thus, their conceptualization of cognitive engagement includes class participation, attention, flexibility in problem solving, on-task behaviour, preference for hard work, and positive coping in the face of failure.

Other authors using the motivation perspective have included as a key component of engagement, the *intrinsic motivation* of the student. For example, Voelkl (2012) states that research supports the idea that 'students are more likely to be engaged, expend more effort in the classroom, and to persist in learning tasks when they place high value on school work' (p.198). Thus, when values are internalized by the students, they become intrinsic motivators of behaviour and engagement (Deci & Ryan, 1985). Reeve (2012) also argues that intrinsic motivation affects the degree of student engagement, as well as the academic performance, and the learning activities in which students participate. These ideas are in line with prior research by Harter (1996), who suggests that a child with a preference for challenging tasks is a child who is intrinsically motivated to engage in the mastery process.

Similarly to the authors working on motivation theory, Skinner and Pitzer (2012) developed a model of engagement grounded on self-determination theory. According to the model, motivation is the underlying source of energy, purpose, and durability whereas engagement refers to their visible manifestation. Based on the model and with the understanding that engagement includes behavioural, cognitive and emotional components, Skinner and Pitzer argue that the cognitive component encompasses attention, concentration, focus, absorption, head-on participation, and a willingness to go beyond the requirements. Specifically, they define *student engagement with academic work* as 'constructive, enthusiastic, willing, emotionally positive, and cognitively focused participation with learning activities in school' (ibid., p.22; see also Skinner et al., 2009).

The third line of research corresponds to the literature on learning and instruction, and defines cognitive engagement in terms of being strategic or self-regulated. One of the pioneering studies using this view is the work by Corno and Mandinach (1983), who state that self-regulated learning is the highest form of cognitive engagement. In their conceptualization,

self-regulated learning is understood as a sequence of learning activities (i.e. alertness, selectivity, connecting, planning and monitoring), which are critical to maintain student motivation in the classroom.[6]

Pintrich and De Groot (1990) also suggest that cognitive engagement refers to the student's ability to self-regulate. They argue that self-regulation has three major components, the use of metacognitive strategies for planning, monitoring, and modifying cognition; the ability to manage and control efforts (e.g. being persistent when faced with difficult tasks, or block out distracters to maintain cognitive engagement while working); and the use of cognitive strategies to understand and remember the academic material (e.g. rehearsal, and organizational efforts). The authors claim that in order to foster academic achievement, it is necessary that students are motivated to use these strategies (see also Weinstein & Mayer, 1986; Blumenfeld & Meece, 1988; Zimmerman, 1990).

Conceptualizations of cognitive engagement such as the students' use of metacognitive strategies have also come from the literature on motivation. For example, Guthrie, Wigfield, and You (2012), define engaged readers as 'motivated to read, strategic in their approaches to comprehending what they read, knowledgeable in their construction of meaning from text, and socially interactive while reading' (p.602). However, the authors distinguish between the use of deep and superficial strategies. They suggest that 'deep processing strategies consist of making inferences, forming summaries, integrating diverse elements, and monitoring one's comprehension during reading' (ibid., p.615), while superficial strategies are characterized by memorizing, and seeking to complete tasks rather than comprehending fully (see also Reeve, 2012).

Behavioural engagement

In general, scholars define behavioural engagement in two different ways, as related to students' participation, or as related to investment in learning and academic tasks. Again, the differences in approach depend on the theoretical framework adopted by the author. In the

[6] The term *alertness* refers to gathering information or receiving incoming stimuli; *selectivity* refers to a distinction between relevant and irrelevant information; *connecting* implies linking familiar knowledge to incoming information; *planning* is understood as approaching a task as a sequence; and *monitoring* refers to the continuous tracking of stimuli and implies rehearsing and self-checking.

first approach, scholars conceptualize engagement in terms of *participation* at the school and classroom level. The concept of *participation* refers to the positive conduct of students, and includes indicators such as paying attention in class, participating actively in discussions, going beyond the minimal academic requirements, going on time to class, working well with other children, spending extra time on classroom related activities or sports, and not interfering with peers' work, among others (Finn, 1989; Connell & Wellborn, 1991; Finn et al., 1995; Birch & Ladd, 1997).

Building on this definition, Finn and Zimmer (2012) conceptualized the term *social engagement* as the extent to which a student follows both written and unwritten classroom rules of behaviour. They suggest that these behaviours may include interacting appropriately with teachers and peers, not withdrawing from participation in learning activities, and not disrupting the work of other students. Most importantly, they also claim that a high degree of social engagement facilitates learning.

In the second approach, scholars conceptualize engagement in terms of the *investment* in learning. For example, Skinner and Belmont (1993) suggest that engaged students show sustained behavioural involvement in learning activities, and that they 'select tasks at the border of their competencies, initiate action when given the opportunity, and exert intense effort and concentration in the implementation of learning tasks' (p.572; see also Newmann et al., 1992; Furrer & Skinner, 2003; Skinner, Kindermann, & Furrer, 2009).

Also, conceptualizing engagement in terms of *investment*, Marks (2000) provided one of the most well-known definitions of behavioural engagement. She suggests that it is the 'psychological process, specifically, the attention, interest, investment, and effort students expend in the work of learning' (p.155). Most recently, Fredricks et al. (2004) described it as the involvement in learning and academic tasks, and included in their definition behaviours such as 'effort, persistence, concentration, attention, asking questions, and contribution to class discussion' (p.62). Similarly, Skinner and Pitzer (2012) defined behavioural engagement as the 'effort, intensity, persistence, determination, and perseverance in the face of obstacles and difficulties' (p.24).

Emotional engagement

Going back to the definition on engagement provided by Finn (1989), he states that emotional engagement can be understood as the *identification* component of the participation–identification model. He claims that the term *identification* refers to an internalized conception of belongingness, which is materialized when the student feels that she or he is a significant member of the school community.

Following this approach, Fredricks and McColskey (2012) included in their definition of emotional engagement, the students' feeling of being important to the school and valuing success in school-related outcomes. Similarly, Appleton (2012) conceptualized emotional engagement as the 'affiliation/identification with school, including the staff and students that populate it and the emotions experienced during tasks of schooling' (p.726).

Other scholars have linked the term emotional engagement to the emotional reactions of students to their schools and teachers. For example, Skinner and Belmont (1993) suggest that emotionally engaged students show positive emotions such as enthusiasm, optimism and curiosity during ongoing action. Similarly, Fredricks et al. (2004) define emotional engagement as the students' affective reactions in the classroom, including feelings such as boredom, happiness, sadness, anxiety and interest (see also Connell & Wellborn, 1991). Likewise, Darr et al. (2008) mention aspects such as liking (or disliking) the school or feeling safe at school as indicators of emotional engagement.

Although these definitions contribute to a better understanding of the differences between the subtypes of engagement, it is important to consider the limitations in some of them. For example, at the centre of the definitions of cognitive engagement lies the concept of *investment*, however scholars have failed to explain in detail what exactly a student *invests*, or what specifically this term entails. Also, a distinction must be made between students who are highly strategic because they enjoy learning and are interested in mastering the knowledge, and students who are highly strategic because they are grade-driven. Similarly, in the literature on behavioural engagement, terms such as *hard work*, *mental effort*, or *going beyond requirements* need further examination.

Disengagement vs. disaffection

Another difference between the scholars who have conceptualized engagement is whether or not they explore the relationship between engagement and disengagement, that is, if they understand engagement as a single continuum or two continua of engagement and disengagement.

In general, the literature uses the expressions engagement and disengagement, as if one was contrary to the other (Finn, 1989; Janosz, 2012). However, some scholars are starting to conceive disengagement as more than the absence of engagement, and therefore are starting to separate engagement and disengagement in two dimensions (Jimerson et al., 2003; Griffiths, Lilles, Furlong, & Sidwha, 2012; Reschly & Christenson, 2012). An example of the first view is the definition of Finn and Zimmer (2012), who state that disengaged students are those 'who do not participate actively in class and school activities, do not become cognitively involved in learning, do not fully develop or maintain a sense of school belonging, and/or exhibit inappropriate or counterproductive behaviour' (p.99).

Contrarily, Skinner et al. (2009) employ a definition of *disaffection* that includes the concept of *emotional disaffection* (i.e. mental withdrawal) and which refers to lack of concentration, frustration, boredom, sadness and anxiety, which do not necessarily imply the opposite of participating or exerting effort (see also Skinner & Belmont, 1993; Appleton et al., 2006; Skinner, Furrer, Marchand, & Kindermann, 2008).

Adopting a theoretical framework

Taking into consideration the definitions presented above, I decided to adopt the theoretical perspective proposed by Fredricks and McColskey (2012). As mentioned before, their seminal work reflects the consensus among scholars that student engagement is a metaconstruct with behavioural, emotional and cognitive dimensions. Moreover, these authors provide a definition of the subtypes of engagement that is widely accepted in the literature.

Building on this consensus, this research defines *cognitive engagement* as the student's level of investment in learning, which includes being thoughtful, strategic, and willing to exert the

necessary effort for comprehension of complex ideas or the mastery of difficult skills; *behavioural engagement* as involvement in academic, social, or extracurricular activities and displaying positive conduct; and *emotional engagement*, as identification with the school, which includes belonging, or a feeling of being important to the school (Fredricks & McColskey, 2012).

Adopting these definitions implies that the instrument to be used to measure the construct of engagement should reflect its multidimensional nature. Therefore, in the case of a student self-report measure, it should contain items for each type of engagement. Following the definition, items on *behavioural* engagement should ask students to report on their attention, time on homework, preparation for class, class participation, concentration and adherence to classroom rules. Items on *emotional* engagement should be focused on students' emotional reactions to school such as having supportive or positive relationships with teachers and peers, and expressing feelings of belonging. Questions on *cognitive* engagement should enquire about the use of self-regulatory strategies and cognitive strategies, and about the value of schooling and future aspirations.

SECTION III – Factors Facilitating Student Engagement

Given the multiple factors determining student engagement, and in order to understand the complexities of this phenomenon, the following section begins by describing non-school predictors of student engagement, such as the ones inherent to the individual students and their families, and then provides evidence on the importance of school-related factors. Given that this research is mainly interested in the role of teachers influencing student engagement, the last part of the section discusses the relationship between teacher practices, cognitive, behavioural and emotional engagement, and educational outcomes. The importance of this section is that it clarifies what teacher practices (and other contextual factors) can be expected to be observed in engaging classrooms during the fieldwork.

Home factors

Scholars have explored for decades the link between students' academic success and parenting support and have found that the encouragement of *academic participation* is one

important pathway through which parents effectively influence students' performance at the school level. For instance, Clark (1983) argues that parents of high achievers from socioeconomically disadvantaged backgrounds provide emotional support to their children, so they are able to participate and succeed in their academic endeavours. According to the author, the support is materialized when parents encourage their children to perform at a high level, provide reassurance when they face failure, assist them in acquiring learning strategies and promote continuous practice of the learning material.

The literature also indicates that the skills, knowledge, and attitudes of parents are important factors through which parents effectively influence students' performance. Examples of these include providing children with a home environment characterized by discipline and stimulation aside from school work, having high standards for school achievement, and giving priority to school work (Connell & Wellborn, 1991; Grolnick, Ryan, & Deci, 1991; Furrer & Skinner, 2003; Oreopoulos, Page, & Stevens, 2003; Michael, 2004; Cassen, McNally, & Vignoles, 2015).

Likewise, extensive empirical evidence has linked the socioeconomic background of the students with their academic achievement and some indicators of their level of engagement. For example, there is consistent evidence that dropout is more likely to occur in poorer communities, and that minority students participate less fully in learning-related activities in class, exhibit more behavioural problems in school, and have higher rates of absenteeism from class and school in comparison to their nonminority peers (Wehlage & Rutter, 1986; Rumberger, 1987; Rosenthal, 1998; Rumberger, 1995; Finn & Rock, 1997; Reschly & Christenson, 2006, 2012).

Although the evidence suggests lower levels of engagement in disadvantaged communities, it is important to clarify that this might be caused by financial constraints and a range of different contextual factors that are arguably distinct from engagement. Among these contextual factors, the literature includes not only the lack of financial resources *per se* (which leads to a worse quality of schooling, housing, educational materials and nutrition, among others), but also other factors associated with poverty such as the parents being less likely to have high educational expectations, to value education, to provide children with learning opportunities, and to be involved in their child's schooling, among other

characteristics of supportive environments that are essential for academic success (Cassen et al., 2015).

Personal factors

Personal factors can also be predictors of student engagement. According to Skinner and Pitzer (2012), 'perceptions of self-efficacy, ability, academic competence, and control are robust predictors of student engagement and eventual learning, academic performance and achievement' (p.27). This view is shared by the authors of the PISA 2012 report (OECD, 2013c), who argue that locus of control, intrinsic and extrinsic motivation, self-efficacy, and self-concept, are all promoters of student engagement and achievement[7] (see also Skinner, 1996; Bandura, 1997; Weiner, 2005; Wigfield, Eccles, Scheifele, Roeser, & Davis-Kean, 2006).

The gender of the students has also been associated in the literature with different levels of engagement (Rosenthal, 1998; Bingham & Okagaki, 2012). Even though the international literature suggests that gender differences on engagement vary considerable among countries, the 2000 PISA report indicates that on average females are about 7 per cent less likely to exhibit low *participation* in academic and non-academic activities than males.[8] The 2012 PISA report revealed that on average girls were less likely than boys to report having arrived late to school in the two weeks before the test,[9] although the same percentage of boys and girls reported having skipped a day of school in the same period of time. These results indicate that on average girls tend to be more behaviourally engaged than boys across the OECD countries (OECD, 2013c).[10]

[7] The authors define locus of control as the extent to which students believe they can succeed in academic endeavours if they put in enough effort; self-efficacy as the extent to which students believe in their own ability to solve a particular task; and self-concept as the students' beliefs in their own abilities.
[8] The participation component (which can be related to behavioural engagement) is defined as being prepared for class, completing homework and attending lessons, among others (OECD, 2003).
[9] Specifically, 35 per cent of the boys in the sample reported having arrived late for school, while 32.5 per cent of girls did.
[10] These results are in line with empirical literature suggesting that males are more likely to drop out of school and to be suspended than females, and that females are more likely to stay engaged and graduate from high school (Rosenthal, 1998; Bingham & Okagaki, 2012; Finn & Zimmer, 2012; Finn & Servoss, 2014).

The same was true for emotional and cognitive engagement. Specifically, the report suggests that in 20 of the 65 participating countries, girls tend to *have a stronger sense of belonging* to school than boys, while in 13 countries boys have a stronger sense of belonging.[11] Similarly, in none of the countries that participated in the study did boys report having more *positive attitudes towards schools* than girls. This variable measured aspects such as the importance of the school for the future and the pleasure students derive from working hard at school.

In the same path of results, the report indicates that Mexican girls were more emotionally and cognitively engaged than boys.[12] Regarding their behavioural engagement, the report revealed that the percentage of students who reported having arrived late to school was the same for boys and girls (i.e. 39.9 per cent); that more boys than girls have skipped a day of school in the two weeks prior to the test (i.e. 21.5 vs. 20.3); and that girls have skipped fewer classes in the two weeks prior to the PISA test than boys (OECD, 2013c).

The influence of peers on student engagement is also well documented by researchers as a factor influencing student engagement. In general, the literature suggests that experiences with peers are important determinants of student engagement and academic performance (Furrer & Skinner, 2003; Libbey, 2004). For instance, Steinberg, Lamborn, Dornbusch, and Darling (1992) argue that peers are essential for student engagement, as they can influence the amount of time students spend doing homework, the pleasure they find going to school, and their behaviour in the classroom.

Likewise, Harter (1996) found a link between students' perceptions of peer support and academic goals, engagement, and self-concept (see also Wentzel, 1998). Similarly, Furrer and Skinner (2003) found that 'children who are rejected by their peers, who experience more loneliness and social isolation, and who affiliate with more disaffected peers are themselves

[11] In the PISA report for the year 2012, the students' sense of belonging is understood as the students' feeling of being accepted and valued by their peers and by others at their school. Specifically, the test asked students to report whether they 'strongly agree', 'agree', 'disagree' or 'strongly disagree' that they feel like an outsider or left out of activities, that they make friends easily, that they feel like they belong, that they feel awkward and out of place, that other students seem to like them, and that they feel lonely, and also asked students to evaluate their happiness. This definition is comparable to the definition of emotional engagement in this research.

[12] The results for Mexico show a mean in the index of sense of belonging to school of 0.04 for boys and 0.16 for girls, and a mean in the index of attitudes towards school of 0.25 for boys and 0.45 for girls (OECD, 2013c).

more likely to become disaffected from academic activities and eventually leave school' (p.150; see also Midgley & Urdan, 1995).

Another factor that has been linked to student engagement is the transition to adolescence. In this regard, the literature suggests that there is a decline in students' intrinsic motivation, preference for challenge, curiosity and interest, as well as a loss of emotional and behavioural engagement, from elementary to middle school.

The literature suggests these changes in engagement can in part be caused by the emphasis on evaluation, and low self-worth due to lack of ability to achieve competitively (Gottfried, Fleming, & Gottfried, 2001; Lepper, Corpus, & Iyengar, 2005; Gottfried, Marcoulides, Gottfried, Oliver, & Guerin, 2007), or by poor person–environment fit, or produced by a lack of opportunities for autonomy and relatedness (Eccles et al., 1993; Wigfield & Eccles, 2002). However, other authors suggest that teenagers also start having greater self-reflection, become more deliberate and develop self-regulatory skills, which lead them to display moderate to high levels of engagement, albeit lower than in the middle school years (Mahatmya, Lohman, Matjasko, & Farb, 2012).[13]

School and classroom level factors

At the school level, the literature indicates that perceptions of safety and trust are linked to student engagement. Specifically, scholars have found that perceptions of unfair treatment, disciplinary policies that are too harsh, and an unsafe environment are associated with a decrease in the behavioural and emotional engagement of the students and with school abandonment (Marks, 2000; McNeely, Nonnemaker, & Blum, 2002; Ma, 2003; Ripski & Gregory, 2009).

Although these factors influence student engagement, the literature clearly points out that among school level variables, leadership stands out as a prominent factor influencing school effectiveness and some indicators of student engagement. Even though the following discussion is not intended to provide a comprehensive review on the role of leadership, as

[13] Over the past decade there has been a proliferation of literature investigating self-regulation in adolescents. For a review of the literature on this topic, see Blakemore and Robbins, 2012; and Duckworth, Akerman, MacGregor, Salter, and Vorhaus, 2009.

the research is focused on teacher practices, it is crucial to acknowledge its importance and present the evidence on its impact on academic attainment.

School leadership is recognized in the literature as having a significant impact on school effectiveness and student achievement (Hallinger & Heck, 1996; Waters, Marzano, & McNulty, 2003; Hargreaves & Fink, 2006; Kruger, Witziers, & Sleegers, 2007), particularly in schools facing challenging circumstances (Gezi, 1990; Reitzug & Patterson, 1998). When describing the relationship between school leadership and achievement, scholars make a clear distinction between the impact of principals who implement direct leadership, and principals who exercise indirect leadership. The former is defined in the literature as the active involvement of principals in the instructional enterprise of the school, through the immediate interactions with teachers about the classroom, teaching, pedagogical capacities, student performance and curricula (Kleine-Kracht, 1993; Kruger & Scheerens, 2012).

Indirect leadership refers to the support on improving academic attainment through non-instructional approaches, such as developing a vision and school purpose, setting goals, communicating expectations for performance, and monitoring the work activities at the school site. This view is also related to the idea of transformational leadership and distributed leadership, which recognizes that leadership is not exclusively characteristic of one exceptional individual but can be developed within all staff using governance structures and organizational processes to empower staff members to implement school-wide actions directed towards school improvement (Burns, 1978; Glasman & Heck, 1992; Leithwood, 1994; Marks & Printy, 2003; Leithwood & Jantzi, 2000; Crawford, 2014).

Although scholars have found evidence of a positive relationship between leadership and achievement, they suggest the influence of the principal on student outcomes is largely indirect. According to the literature, the mediating factors include staff motivation, a shared mission and vision, a strong sense of professional identity among teachers, positive relationships among the school community, teacher classroom practices, and student engagement (Pounder, Ogawa, & Adams, 1995; Hallinger, Bickman, & Davis, 1996; Hallinger & Heck, 1998; Bell, Bolam, & Cubillo, 2003; Leithwood & Levin, 2005; Mulford & Silins, 2003; Leithwood, Day, Sammons, Harris, & Hopkins, 2006).

Regarding the specific contribution of leadership to student engagement, the literature is still limited. However, the studies by Leithwood and Jantzi (2000) and Leithwood and Levin (2005) provide a unique insight into the nature of the relationship. According to the authors, there is a positive and significant effect of leadership practices on the behavioural and emotional engagement of the students, which is mediated by five school-level conditions, namely: purpose of goals, school planning, organizational culture, professional learning and collaboration, and information collection.[14]

At the classroom level, research has identified factors such as classroom size, safety rules and disciplinary practices as promoters of student engagement (Finn & Zimmer, 2012). For example, Dee and West (2011) suggest that large classes, in which the time and attention that teachers devote to students is limited, are more likely to have disruptive and disengaged students. Likewise, several studies have found that in smaller classes, in which individual pupils are the focus of the teacher's attention for more time, and there is more active interaction between students and teachers, pupils are more engaged (Lindsay, 1984; Lee & Smith, 1993; Department for Education, 2011; OECD, 2013d). Similarly, Darling-Hammond, Ancess, and Ort (2002) suggest that an increase in school participation can be obtained by promoting small-school dynamics, or small learning communities, even when schools have large enrolment rates.

However, the literature suggests that among the school and classroom-level variables, teacher practices play the most important role promoting the cognitive, behavioural and emotional engagement of the students. Specifically, the research suggests that teachers influence student engagement through three different pathways, namely through student–teacher interaction, instructional practices and classroom management. Most importantly, the

[14] According to Leithwood and Jantzi (2000), *purpose of goals* refers to the perception of the staff that the school's goals are clear, meaningful, useful, current and congruent with district directions; *school planning* refers to the actions taken to accomplish the mission and goals of the school, and which bring together the local needs and the district goals; *organizational culture* relates to the ability of the staff members to develop shared meanings and values, so they are able to reach consensus and plan cooperatively; *structure and organization* refers to the relationships among people in the school that facilitate professional learning and opportunities for collaboration; and *information collection* relates to the nature and quality of information collected for decision making in the school and the ways in which members of the school use that information to make decisions.

literature also suggests that the *cognitive* and *behavioural* engagement promoted by the teacher is a mediator on achievement.

Having this in mind, the rest of this section is devoted to a comprehensive review of the empirical evidence on the link between teacher practices, student engagement and academic achievement. This section is of particular importance given that it is to this specific literature that this research will be contributing. Also, the final idea of the research and the subsequent design were both based on the findings that will be presented below.

An important remark is that despite the evidence from the developed world, the study of engagement has been largely neglected in research in Mexico, and in Latin America more generally, making it an understudied area. Although the literature presented below includes the few studies in Latin America on engagement (and the rare studies documenting the relationship between teacher practices, engagement and achievement) most of the literature presented is from the developed world. To this researcher's knowledge only the study by Weiss and García (2015) has examined the relationship between these three variables in the Mexican context.

Student–teacher relationship

Teachers play a central role in shaping children's experience in school. Beyond the traditional role of teaching academic skills, teachers are also responsible for providing support, motivation and a respectful and safe environment, among many other actions that promote students' success in the classroom. In this regard, the research has found that teachers influence positively the cognitive, behavioural and emotional engagement of the students through the establishment of a student–teacher relationship characterized by warmth and support. However, the research suggests the link between the teacher–student relationship and achievement is indirect. That is, having a positive relationship with the teacher leads to increases in *behavioural* and *cognitive* engagement, both of which mediate subsequent achievement.

Voelkl (1995) conducted one of the earliest and most influential studies on this subject and found, by using a model of multivariate analysis of covariance and a sample of 13,121 8th-

graders, that teacher warmth was significantly related to academic achievement and *participation*. Most importantly, the results also suggest that 'the relationship between warmth and achievement was nonexistent after the effect of *participation* was eliminated' (p.127). In the study, school warmth was defined as the teachers' warmth, caring, and supportiveness, and included indicators about whether or not students got along well with their teachers, and whether or not teachers were interested in students, praised their effort and listened to what they say. Academic participation was measured by indicators of attendance, preparation and misbehaviour.

These results are consistent with a study by Lee (2012), who investigated the relationship between the students' perceptions of the teacher–student relationship, their behavioural and emotional engagement, and their academic performance. Although the data used in the research is limited to the United States (i.e. PISA 2000) the results are relevant as they revealed that the variable teacher–student relationship was a significant predictor of behavioural and emotional engagement, and reading performance. Lee speculates that this may be the case, as students who had a positive relationship with the teacher made more effort and persevered in learning (i.e. were more *behaviourally engaged*), because they internalized the academic values and expectations appreciated by the teacher, and consequently performed better.[15]

These results are in line with a longitudinal study by Hamre and Pianta (2001), who followed a sample of kindergarten children through 8th grade, also in the United States, to examine the extent to which teachers' perceptions of their relationships with students predicted students' *academic* and *behavioural outcomes*. The findings revealed that a supportive teacher–student relationship was positively related to social self-concept and school adjustment, whereas it was negatively associated with externalizing behavioural problems and school dropout.

[15] In order to measure the quality of the teacher–student relationship, the author asked students about the degree to which they agree that their teachers get along well with them, were interested in their wellbeing, really listen to what they have to say, provide extra help when they need it, and treat them fairly. Behavioural engagement was understood in the study as the student effort and perseverance in learning activities (i.e. working hard, working despite difficulty, trying one's best to acquire knowledge and skills). Emotional engagement was defined as the students' sense of belonging at school.

In terms of academic outcomes, the results indicate that kindergarten teachers' perceptions of relational negativity significantly accounted for variance in Mathematics and Language arts grade composites in lower elementary classes, and in standardized test scores in both lower and upper elementary classes. According to the authors, the evidence shows that 'beyond cognitive functioning and classroom behaviour, children's ability to form relationships with their teachers forecasts later academic and behavioural adjustment in school' (p.634).

Based on the premise that relatedness to key social partners triggers behaviours such as effort, persistence, and participation, Furrer and Skinner (2003) studied the link between children's sense of relatedness to the teacher (i.e. high-quality teacher–student relationship, and feelings of belonging, inclusion, acceptance, importance, and interpersonal support), engagement and student achievement. Using a sample of 948 students in 3rd to 6th grade, and regression techniques, the authors found that associations between students' sense of relatedness to teachers and academic performance were mediated by their engagement in learning.

Specifically, the authors suggest that this might be the case as 'feelings of belonging may have an energetic function, awakening enthusiasm, interest, and willingness to participate in academic activities' (p.158). They also argue that it seems to be more fun for students to be involved in activities with people that they like and by whom they feel liked in return, and that the sense of relatedness to the teacher may also buffer against negative emotions, minimizing feelings of boredom, anxiety, pressure, or frustration (see also Marks, 2000; Skinner & Belmont, 1993; Decker et al., 2007).

Although Ladd and Dinella (2009) did not focus on teacher practices, unlike the previous research, their findings are relevant as they explore the relationship between behavioural and emotional engagement, and achievement using longitudinal data. After conducting a 9-year study following children from kindergarten through 8th grade from varied ethnic and socioeconomic backgrounds, the authors found that although gains in *emotional and behavioural engagement* correlate positively with early and later achievement, it was mainly the gains of students in the *behavioural* component (and not in the emotional component) that predicted children's achievement growth.

Similarly, Finn and Zimmer (2012) conducted a longitudinal study to explore the development of emotional and behavioural engagement and its relation to achievement over time.[16] Using data from 2,728 4th- and 8th-grade students and multi-level modelling, they found find that in both grades, behavioural engagement positively correlates with scores in Mathematics and Reading, and high school completion. The findings also reveal that emotional engagement affected academic achievement indirectly through its impact on students' classroom behaviour.

As mentioned at the beginning of this section, the literature in Latin America is extremely limited. For this reason, the study by Weiss and García (2015) using data from Mexico makes an important contribution to the literature on engagement in the region. In this unique study, the authors investigate the relationship between *emotional engagement* (with the teachers and the schools) and academic performance in Mathematics, Science and Language, and its relative importance in comparison to other educational inputs as predictors of performance.

Using data from 15,595 Mexican students who participated in PISA 2003, and hierarchical linear models, the authors find that strong engagement with the *school* positively affects students' achievement. In fact, the estimates are similar to those of socioeconomic status or family composition. However, the findings also suggest that a strong engagement with *teachers* does not necessarily improve achievement, and can even negatively correlate with performance[17] (see also Voelkl 1997; Osterman, 2000; Ma, 2003; Booker, 2004; Voelkl, 2012; Garcia, Maldonado, Perry, Rodriguez, & Saavedra, 2014).

Although the study by Blanco (2008) does not focus on student engagement but on classroom climate, it is relevant as it studies some aspects of classroom climate that are related to the teacher–student relationship in the Mexican context. Using a national standardized test in Mathematics and Language from Mexican students in 6th grade and multi-level modelling,

[16] In the research behavioural engagement is understood as the extent to which the students pay attention, complete homework, come to class prepared, participate in academic curricular activities, attend school, and follow directions. Emotional engagement relates to the identification or feeling of belonging to the school.

[17] In the study, the measure of engagement with *teachers* focuses on psychological feelings of connection and is based on responses to five questions that ask about students' perceptions of their teachers' concern for and interest in their students, as well as perceived teacher fairness. The measure of engagement with the *school* refers to the students' sense of belonging in school and is composed of six questions that ask students about their feelings of acceptance by their peers, about whether or not they feel like 'an outsider' in the school setting, and about feelings of loneliness.

the author found that the extent to which the teacher provides advice to the students when they had problems, listens to them, encourages them to attend secondary school, and explains the material until everyone has understood, was positively associated with better learning outcomes in Language, and with reductions in the advantages in Mathematics associated to the socioeconomic background of the students. In this regard, the author suggests the level of trust between the teacher and the students plays a major role in the results (see also Cervini, 2004).

As can be seen from the previous literature, scholars have focused mainly on studying the relationship between teacher–student relationships, achievement and *behavioural* and *emotional* engagement and to a lesser extent cognitive engagement. For this reason, the longitudinal study by Hughes, Luo, Kwok, and Loyd (2008), examining the effects of the teacher–student relationships on changes in *effortful engagement* and consequently on attainment, is of relevance for this research.[18]

Using a randomly selected sample of 671 students in Texas, and achievement test scores in Mathematics and Reading, the authors found that having a positive social and emotional relationship with a teacher in the 1st grade, shapes children's positive patterns of engagement in learning. This in turn leads to more supportive relationships with teachers in the following years, and to higher levels of achievement. Equally importantly, the authors found that a positive teacher–student relationship has larger effects on students who have poor self-regulatory competences.[19]

Instructional practices

Empirical evidence from the last two decades suggests that instructional practices facilitate student engagement (particularly cognitive), and improve the students' ability to perform at a high level (Johnson, Johnson, Buckman, & Richards, 1985; Willms, Friesen, & Milton,

[18] In the research, effortful engagement refers to the 'volitional, or effortful aspect of involvement in instructional activities and includes trying hard, not giving up in the face of difficulty, and directing one's attention to instructional activities' (p.3). The quality of the student–teacher relationship is measured based on teachers' responses about the level of warmth, support and conflict in their relationships with individual students.

[19] For evidence on the link between student–teacher relationship and engagement in self-regulated learning, see Peterson, Swing, Stark, & Waas, 1984; Wentzel, 1997; Ryan and Patrick, 2001; and Hughes and Kwok, 2007.

2009; Parsons & Taylor, 2011; Finn & Zimmer, 2012). The evidence presented below groups the instructional approaches that have been proved by scholars to promote engagement and achievement in four themes, namely: *assigning challenging work*, *using cognitive strategies*, *providing clear learning goals and instruction*, and *implementing inquiry-based learning*.

Assigning challenging work

Both quantitative and qualitative studies from the developed world have found consistent evidence of higher levels of behavioural and cognitive engagement (e.g. greater use of metacognitive strategies) in classrooms where teachers press for mastery and participation, present activities that are cognitively challenging and relevant, and expose students to a challenging curriculum (Newmann, 1981; Blumenfeld & Meece 1988; Blumenfeld, Mergendoller, & Puro, 1992; Marks, 2000; Davis & McPartland, 2012; Hipkins, 2012).

Although it is not possible to claim such consensus in the literature from Latin America, or even cite evidence from several studies in the region, a unique study by Carnoy, Gove, and Marshall (2007) provides evidence on the same line of findings in three countries in the region. Given the outstanding results of 3rd- and 4th-grade Cuban students in the Mathematics and Language test from the International Laboratory Survey conducted by UNESCO,[20] the authors conducted a comparative analysis among Cuba, Chile, and Brazil, to determine the factors that explain the academic advantage of Cuban students.

Although the explanation includes a variety of factors ranging from the role of students' families to policies on nutrition, the results at the classroom level suggest that among other influential variables, students in Cuba were more behaviourally engaged than their counterparts in Brazil and Chile, as the tasks assigned by Cuban teachers were considerably more cognitively demanding when compared to the tasks in the other two countries (in fact, the content of the textbooks in Cuba was more advanced than in Brazil and Chile).

[20] Cuban results were almost double the grades of the nearest countries in the evaluation.

Using cognitive strategies

Although the majority of research has focused on the more observable indicators of engagement, the evidence from the last two decades suggests that psychological indicators are also of importance to school performance. For example, Greene, Miller, Crowson, Duke, and Akey (2004) found a robust relationship between the use of cognitive strategies and personal goal orientation and investment in learning, which in turn was associated with student achievement in English.[21] Similarly, Wigfield et al. (2008), using an experimental design to compare groups of 4th-graders, found that the groups who received support for the use of cognitive strategies in Reading improved their 'reading engagement' (associated to cognitive engagement). More importantly, they found that engagement had a moderate to high significant correlation with students' scores on reading comprehension tests (see also Rowe & Rowe, 1992; Greene & Miller, 1996; Fredricks et al., 2004).

Likewise, Wolters and Pintrich (1998) found a positive correlation between the use of cognitive strategies and better learning outcomes in English, Mathematics and Social Studies. These strategies include the ones used to plan, monitor and control learning, such as elaboration and rehearsal (see also Graham & Golan, 1991; Pintrich & Garcia, 1991; Miller, Greene, Montalvo, Ravindran, & Nicholls, 1996; Howse, Lange, Farran, & Boyles, 2003).

Providing clear learning goals and instruction

The literature is consistent in pointing out that instructional clarity is an important variable explaining the teachers' ability to engage students. This ability refers to the degree to which teachers provide clear learning goals and instruction to support achievement. This includes providing pupils with clear expectations of their performance, giving them feedback, explaining the concepts in ways that are understandable and connected to students' real-world experiences, explaining numerous times, and connecting abstract concepts using concrete examples, among others (Allensworth, Gwynne, Pareja, Sebastian, & Stevens, 2014).

[21] In order to measure students' use of deep cognitive strategies, the authors assessed students' ability to establish goals for learning, check for understanding, check work for errors, and put ideas in their own words, among others.

Guthrie and Davis (2003), using data from the United States to investigate classroom practices that help struggling middle school readers, provided strong evidence on the importance of having a classroom environment that fosters cognitive engagement. According to the authors, teachers in engaging classrooms provide students with direct strategy instruction (i.e. modelling, scaffolding, feedback and opportunities for independent reading), use real-world interactions to connect content to students' experiences, and construct rich knowledge goals as the basis of the instruction.

Similarly, other experimental studies and classroom-based analyses have found that students are more likely to be cognitively engaged when teachers use an active approach to learning, characterized by providing clear directions, relating information to what students already know, suggesting the use of cognitive strategies and providing feedback (Brophy & Good, 1986; Weinstein & Mayer, 1986; Greene & Miller, 1996; Turner et al., 1998). According to Blumenfeld and Meece (1988), these practices increase students' understanding of what to learn and how to learn it, and therefore impact achievement (see also Stipek, 2002).

Two studies from Latin America documented a similar line of research. First, a study by Fernandes and Ferraz (2014), who, using data from Sao Paulo, Brazil, studied teacher effectiveness based on the teachers' abilities to produce value-added learning gains. The results revealed that the differences in individual teachers' effectiveness were largely explained by the teacher's ability to engage students. In line with the evidence from the developed world on the importance of instructional clarity, the findings of the study revealed that students' learning gains in Mathematics were between 0.13 and 0.22 standard deviations higher in classrooms where teachers 'regularly assign homework, correct homework, explain material until all students have understood, provide a variety of problems to be solved, and relate math content to everyday situations' (p.11).[22]

[22] Another remarkable finding from the research is that according to the authors the impact of these practices may be related with the rarity of their occurrence in the classroom. The authors revealed that only 14 per cent of the students reported that their teacher 'always or almost always' assigns Mathematics homework, and only 5 per cent report this was the case in Language. Only 6 per cent of the pupils reported that their teacher 'always or almost always' related Mathematics content to real-world situations, and only 4 per cent said so referring to the Language class.

The second study by Garcia et al. (2014) used data from high and low performing schools in Colombia to determine the level of engagement of the students. The findings suggest that in both types of schools, students felt disengaged and that this was associated with the lack of clarity in the instruction. Specifically, the authors linked student disengagement with the fact that fewer than 50 per cent of the students reported that teachers regularly 'explain what they expect them to learn', 'give timely feedback', 'connect new material to what they already know', 'connect material to their own life experiences' and 'ask questions about the texts they are reading'.

Implementing inquiry-based learning

Although evidence from the past decades supports the idea that inquiry-based learning is an important factor promoting student engagement and better educational outcomes (Newmann, 1992; Dolezal, Welsh, Pressley, & Vincent, 2003; Parsons, McRae, & Taylor, 2006; Hattie, 2009; Blanchard, Freiman, & Lirrete-Pitre, 2010; Minner, Levy, & Century, 2010; Furtak, Seidel, Iverson, & Briggs, 2012),[23] more recent research has offered little evidence on its effectiveness, which has contributed to the lack of consensus in this regard among scholars.

For instance, the PISA report for the year 2015 (OECD, 2016) indicates that in no education system participating in the study do students who reported being frequently exposed to inquiry-based instruction score higher on Science than their peers who did not receive this type of instruction. In fact, the findings suggest that 'greater exposure to inquiry-based instruction is associated with lower scores in science' (p.36). Some of the arguments suggested by scholars who had found evidence on the negative impact of learner-centred approaches, include that its effectiveness depends on the presence of adequate material, on the application of well-designed assessments, on the knowledge and skills of the teachers implementing it and on the existence of a careful and well-structured design of the lesson, among others (Barron & Darling-Hammond, 2010).

[23] Scholars supporting inquiry-based learning argue that this approach arouses the curiosity and anticipation of students (which contributes to student engagement) as the content presented is meaningful, and students are exposed to activities and material that make learning enjoyable and concrete.

Classroom management

In general, the literature refers to classroom management as the actions taken by the teacher to create and maintain a learning environment conducive to successful instruction. These actions include planning and conducting instruction, establishing rules and procedures, promoting cooperative learning, focusing on goals, and expressing high expectation, among many others (Emmer, Sabornie, Evertson, & Weinstein, 2013).

Although the literature from the developed world has found strong evidence on the relationship between classroom management and behavioural engagement, the evidence is not as extensive on its link to cognitive and emotional engagement. The evidence presented below is focused on three aspects of classroom management linked to student engagement that were recurrent in the literature, namely, *maintaining appropriate student behaviour*, *emphasizing hard work and having a no-excuses culture*, and *providing support for autonomy and clear expectations*.

Maintaining appropriate student behaviour

Not surprisingly, a vast body of research suggests that classrooms with more disciplinary problems are less conducive to learning, as disruptions affect students' concentration and engagement (Baines, 2013; Cobb, 1972; Gettinger & Walter, 2012; Haskins, Walden, & Ramey, 1983; OECD, 2011; OECD, 2013d). In a classic piece of research on the subject, Finn et al. (1995) compared the academic achievement of students who were inattentive and disruptive in the classroom, with the performance of students with positive behaviours.[24] The authors found that students rated by their teachers as inattentive, disruptive, and as both inattentive and disruptive, had lower scores than compliant students in all achievement areas. Additionally, they found that disruptive students had higher test scores than inattentive students. A decade after the publication of this research, Finn (2006) corroborates his original findings, in a study revealing that measures of attendance and classroom behaviour were

[24] The authors defined inattentive behaviour as the behaviour displayed by a student who is not focused on the content of class-work, and disruptive behaviour as the behaviour of a student who disturbs the classroom by interfering with others' work.

positively and significantly related to entering and completing a post-secondary programme, and to the number of credits earned.

Similarly, Alexander, Entwisle, and Dauber (1993) used an experimental design to study the effects of children's behaviour on school performance in a period of four years, and found that teachers' ratings of students' *participation* and *attention* (reported by the teacher in the first year) strongly predict test scores in the first, second and fourth year (see also Attwell, Orpet, & Meyers, 1967; Perry, Guidubaldi, & Kehle, 1979; Balfanz, Herzog, & Iver, 2007; Ladd & Dinella, 2009).

These findings are of particular importance for Latin America, as recent research has demonstrated the lack of behavioural engagement of the students in several countries in the region, including Mexico. Specifically, Bruns and Luque (2014), using nationally representative data from Brazil, Mexico, Colombia, Honduras, Jamaica and Peru between 2009 and 2013, found that poor student learning results were directly and strongly linked to the disengagement of students.[25] They refer specifically to the fact that students in three countries were off-task 75 per cent of the class time (i.e. in Colombia, Honduras and Peru), and that in general in all countries students were distracted, or disrupting the work of other students most of the time.

Emphasizing hard work and having a no-excuses culture

Other scholars interested in the influence of classroom management have found evidence on the importance of the teacher's emphasis on hard work and other aspects of the classroom climate to increase student engagement and achievement (Anderson, 1982; Newmann et al., 1992; Appleton et al., 2006; Cohen, McCabe, Michelli, & Pickeral, 2009; Roehrig, Brinkerhoff, Rawls, & Pressley, 2013).

For instance, in a seminal work using data from minority students in the United States, Finn and Rock (1997) studied the importance of different aspects of the classroom climate for the academic achievement of the students. The authors classified students based on their test

[25] Samples in all countries are representative at the national level, except by the samples in Brazil and Mexico, which are representative only for the participating subnational governments of Pernambuco, Minas Gerais, and Rio de Janeiro in Brazil, and the Federal District in Mexico.

scores as academically successful, school completers with poor performance, and dropouts. The authors found that the group of academically successful students was judged to work harder, attend class more regularly and be more engaged with learning activities than their peers in the groups of completers with poor performance and non-completers (see also Hawkins, Guo, Hill, Battin-Pearson, & Abbott, 2001).

The results from the intervention *Check & Connect* show similar findings. This intervention is of particular importance as it is one of the few programmes focused on engagement that has been evaluated using a randomized control trial design. *Check & Connect* was designed to promote student engagement of marginalized and disengaged students in primary and secondary education, and has been implemented across the United States since 1990.[26] The programme is executed by a mentor who helps students in setting goals, self-monitoring, focusing on hard-work, selecting rewards and consequences for achieving or not achieving their goals, and identifying attributes of success and failure, among others.

Results from Sinclair, Christenson, Evelo, and Hurley (1998) show that students who received the *Check & Connect* intervention (i.e. students in the treatment group) were more likely than students in the control group to be enrolled in school and to be on track to graduate on time. These results add to the increasing body of research suggesting *Check & Connect* positively influences student engagement, graduation rates and students' performance (Anderson, Christenson, Sinclair, & Lehr, 2004; Lehr, Sinclair, & Christenson, 2004; Sinclair, Christenson, & Thurlow, 2005; Christenson, 2009).

Most recently, Skinner and Pitzer (2012) found that the promotion of a classroom climate that emphasizes hard work, self-improvement and deep understanding is fundamental to improve students' engagement in academic endeavours and students' achievement (see also Taylor & Parsons, 2011).

Providing support for autonomy and clear expectations

There is an emerging consensus in the literature about the importance of having high and clear standards for academic learning and conduct, and personalized learning environments

[26] Student engagement is defined as spending time, effort, and talents into reaching established goals.

to improve the academic outcomes of the students. In a pioneer study on the topic, Skinner and Belmont (1993) examined the effect of teacher involvement, structure, and autonomy support on 144 children across a school year, and found that teachers' interactions with students predicted students' behavioural and emotional engagement in the classroom. They claim that students, who experience their teachers as providing consistent and predictable responses, clear expectations, and strategic help and support were more likely to be effortful and persistent, which are behaviours associated with better academic attainment.

In the same line of research, Klem and Connell (2004) using longitudinal data from elementary and middle schools in the United States found that students were almost three times more likely to report being behaviourally engaged if they experienced highly supportive teachers.[27] This refers to the students' perception that teachers created a caring, well-structured learning environment in which expectations were high, clear, and fair, and where teachers provided support for autonomy. In turn, students with high levels of engagement were 75 per cent more likely than less engaged students to achieve at a high level and attend school regularly.

According to the literature presented in this chapter, it could be expected to see during the fieldwork that teachers have clear rules of conduct and adequate management of instructional time, that they promote a culture of hard work, and that they provide students with support for autonomy while pressing for mastery and understanding. In addition, teachers in the selected classrooms (i.e. highly engaging) are likely to foster discussion and critical voice; provide feedback; teach students strategies to study; and introduce students to relevant, meaningful and challenging material.

It is also likely that the teachers have good relationships with the students. Specifically, it is expected students would perceive their teachers as caring, supportive, interested in their wellbeing, fair, respectful, and willing to listen to them. Regarding contextual factors, it is expected that selected schools have effective leaders, a safe and warm environment, and serve

[27] Engagement was defined in the research as *ongoing engagement*, which refers to 'the extent to which students exert effort on schoolwork, pay attention in class, prepare for class, and believe doing well in school was personally important' (p.264).

students with supportive parents. It is also likely that girls will be more behaviourally engaged than boys.

CONCLUSION

In sum, the literature review suggests engagement is a construct with multiple components, and highlights the importance of behaviour, emotion and cognition, as parts of that construct. The literature on engagement has changed focus from dropout prevention to the role of engagement in relation to student achievement. The empirical evidence supports the idea that behavioural and cognitive engagement are correlated with academic performance, while emotional engagement affects academic achievement indirectly through its impact on students' classroom behaviour. The review also reveals a gap in the literature on engagement in Mexico and more generally in Latin America.

Researchers have focused on investigating the impact of teachers on student engagement. Specifically, they have focused on identifying the teacher characteristics and practices that foster and hinder student engagement (as well as the students' responses to those practices). Within these practices scholars have found evidence of the importance of implementing effective classroom management strategies, having positive student–teacher relationships, and promoting instructional practices based on challenging work and the use of inquiry-based projects.

Although the engagement literature is extensive and to some extent conclusive on the importance of individual behaviour (at the classroom level) by focusing so minutely on the characteristics and practices of individuals, the research may be said to lose sight of factors from the wider context, such as organizational, socio-cultural and economic factors that may also be playing a determinant role in facilitating student engagement and achievement.

CHAPTER 2: DESIGN AND METHODOLOGY

This chapter elaborates on and justifies the research design and methodological rationale for addressing my research questions. The chapter is divided into four sections. In the first section, I discuss the theoretical perspective and the research questions. In the second section, I discuss the research design of the five research phases. Although this section covers the methods used to address the questions, full details about each method are provided at the beginning of the chapters presenting the quantitative and qualitative analysis. In the third section, I detail issues of access to the data and the schools. In the last section, the ethical dilemmas faced during the fieldwork are considered.

SECTION I – Theoretical Approach

The main purpose of this research is to understand the teacher practices that promote student engagement in a selected sample of marginal schools in Mexico. Given this focus, and understanding the immense complexities of studying human behaviour, and specifically the intricacies of the classroom context where the problems of teaching, learning and human interaction are intangible and far from being ordered, I decided to use a *post-positivist* approach to this study.

According to Robson (2011), for post-positivists 'the theories, hypotheses, background knowledge and values of the researcher can influence what is observed' (p.22). However, the author also argues that post-positivists have 'a continuing commitment to objectivity which they approach through recognizing the possible effects of these likely biases. Post-positivists believe that a reality does exist but consider that it can only be known imperfectly and probabilistically in part because of the researcher's limitations' (ibid., p.22).

For Robson, 'post-positivists are realists in the sense that they believe that there is an external reality' (ibid., p.23) that is separate from the descriptions of it. However, he also states that post-positivists do not agree with the realist view of positivists who claim that 'direct experience is a sound basis for scientific knowledge' (ibid., p.21). Post-positivism also differs from the positivist approach in the sense that the latter held that 'human behaviour is governed by general, universal laws and characterized by underlying regularities' (Cohen,

Manion, & Morrison, 2011, p.15). Following this theoretical approach, the proposed research took a scientific approach in the sense that it was led by a theory, which was tested through the collection and analysis of both quantitative and qualitative data.

Thus, the aim of the research is to investigate if the schools in the sample fit the theoretical proposition of the research. That is, that there are marginal primary schools in Mexico, where students outperform their peers on the national standardized test, due (among other factors) to the teachers' ability to engage students with academic tasks. Hence, students who are more engaged attend schools with good average achievement levels. The research focuses particularly on the classroom experiences of 6th-grade teachers and their students in public schools.

Conceptual framework

As mentioned before, *engagement* is defined in this research as a metaconstruct with cognitive, behavioural and emotional components. Following the conceptualization of *teacher practices* used in the OECD's Teaching and Learning International Survey (TALIS) (Vieluf, Kaplan, Klieme, & Bayer, 2012), this research defines teacher practices as the 'combination of clear, well-structured classroom management, supportive, student-oriented classroom climate, and cognitive activation' (p.13).[28] This conceptual framework brings together the socio-constructivist thinking and the classical process-product research on teachers' practices, which independently are considered insufficient to explain the importance of teachers' practices on student learning.

Following the definition by Guskey (2013), *student achievement* is understood in this research as the accomplishment of articulated cognitive learning goals, which refers to the 'concepts and skills educators strive to have students gain through planned instructional activities' (p.3), and that take place in established instructional environments, specifically in classrooms. Given that cognitive goals span a broad range of subdomains and topics in each subject area, student achievement in this research relates to the cognitive learning goals

[28] Cognitive activation refers for example to providing students with challenging content that promotes deep reflection.

established by the Mexican government in Mathematics and Language for 6th grade (SEP, 2011).[29]

The research focuses on students in 6th grade, which is the last grade level of primary education in the Mexican system. Scholars argue that unlike students in elementary school, students in primary and middle school are able to report information regarding their cognitive engagement (Blumenfeld & Meece, 1988; Fredricks et al., 2004). Instruments to measure behavioural and emotional engagement have also been used successfully with students from the upper elementary school years, which implies that students in 6th grade are able to report on these dimensions as well (Fredricks & McColskey, 2012). Another reason to focus the research on students in 6th grade is because students in primary school in Mexico are exposed to a generalist teacher who teaches them all the subjects.[30] This is relevant for the research because it is assumed that being exposed to a teacher for four hours a day has a greater effect (in terms of engagement), than being exposed to a teacher for only one or two hours a day.[31]

Given the focus of the study on students from disadvantaged socioeconomic backgrounds, there was a need to adopt a marginality measure that helps quantifying the deprivation of the localities where the schools were located.[32] The measure selected is the same used in the reports of the national standardized test (used in this research) and was developed by the National Population Council of Mexico (CONAPO), based on the National Census conducted in 2005. It includes dimensions of education, income, household characteristics, and locality characteristics. The index divides localities into five categories: very low marginality, low marginality, medium marginality, high marginality, and very high marginality.

[29] Even though this research focuses mainly on cognitive domains, I understand *student achievement* as a multifaceted construct that also comprises an affective and a psychomotor domain. The affective domain (as related to achievement) refers to the 'students' attitudes, interests, feelings, beliefs, and dispositions' (Guskey, 2013, p.4), while psychomotor learning requires demonstrations of specific skills (e.g. students' performance in sports or performing arts), and involves learning behaviours such as participation and attendance.

[30] Starting in lower secondary, students have a teacher per subject.

[31] The regular school day in Mexico is from 8:00 a.m. to 12:30 p.m. in primary school (which includes a half-hour break).

[32] In this research, 'localities' refers to both cities and towns that are part of one of the 32 states in Mexico. The localities with the lowest population categorized by CONAPO are localities with a population between 1 and 49 inhabitants. The localities with the highest population are the ones with one million inhabitants or more.

The indicators used to measure the level of exclusion in education in the localities, are the percentage of the population aged 15 years or more who are illiterate, and the percentage of the population aged 15 years or more who did not complete primary education. The indicators used to measure the level of exclusion at the household and locality level, include the percentage of homes without drainage piping or toilet, the percentage of homes with bare earth flooring, the percentage of homes without electricity, the percentage of overcrowded homes, the percentage of employed population in the locality with a monthly income up to two minimum wages, and the locality's population.

Research questions

The following research questions encompass the specific concerns of this study and therefore guide the design and methodology used in the research:

1. What is the level of engagement of the students in the selected 18 classrooms in the sample?

2. What are the teachers' practices and school characteristics that promote student engagement in the selected 18 classrooms in the sample, as reported by the students?

3. What are the teacher practices in the selected two classrooms where students show relative high levels of cognitive, behavioural and/or emotional engagement that may be promoting such engagement?

As can be seen, the first and second questions are descriptive in nature as they are concerned with descriptions of the schools and the classrooms in terms of the engagement level of their students and the practices of their teachers. The first question is crucial for the research because only after knowing the engagement level of the students in the classrooms, will it be worth asking questions number two and three, regarding the specific factors that might promote such engagement.

Contrary to the nature of the first and second questions, the third question is exploratory in nature. This question is interested in the perceptions of teachers, students and head teachers about particular teacher practices at the classroom level that may be promoting student

engagement. In order to answer this question, the research focuses on investigating the phenomena in context; for this reason it concentrates on two cases (i.e. two teachers).

The first and second questions were addressed using a fixed strategy, namely a survey administered to students to determine their level of engagement and the practices of their teachers. The third question was addressed using a flexible strategy, namely a multiple case study, which allows for a more exploratory approach. In addition, in order to avoid the use of a convenient sample, quantitative data on pupil achievement was used to construct the sample of schools.[33]

The research has a multi-strategy design and was guided by the approach of Robson (2011), who considers that this design should be implemented when the research involves not only substantial elements of both quantitative and qualitative data collection but also uses more than one research strategy. In addition, Creswell (2009) suggests that the use of a multi-strategy design implies more than collecting and analyzing quantitative and qualitative data. For the author, it also involves 'the use of both approaches in tandem so that the overall strength of a study is greater than either qualitative or quantitative research' (p.4).

Specifically, an *explanatory sequential mixed methods design* was implemented. According to Creswell (2014), in this design 'the researcher collects quantitative data, analyzes the results, and then uses the results to plan the qualitative research. The quantitative results typically inform the types of participants to be purposefully selected for the qualitative phase and the types of questions that will be asked of the participants. The overall intent of this design is to have the qualitative data help explain in more detail the initial quantitative results' (p.224).[34]

[33] In order to minimize the sample bias, instead of selecting schools based on their ease of access (i.e. use convenience sampling), I decided to select schools based on the value they were adding to the learning of their students. See Section I: Selection of the Schools' in Chapter 3, for further detail.

[34] As can be seen in the following chapter, the results from the first survey enquiring into the level of engagement of students (research question one) helped identifying the schools that participate in the case study (research question three). Also, analysis of the data from surveys provided information to design some of the questions for the interviews (for an example, see question 16 in Appendix 9).

SECTION II – Research Design

In order to have a better understanding of the process that led to answering the research questions, this section presents the five phases of the research design and execution.

First phase – selection of the state

The first phase consisted of identifying the state where the research would be conducted. The initial proposal was to conduct the research in different states, based on the results of their students on the national standardized test. This idea was later considered problematic as states in Mexico are extensive and population within states highly dispersed, which would increase the travel time, and transportation and accommodation costs.[35] Also, some states could not be included in the selection process as they were considered unsafe or because the dialogue with local authorities to gain access to the schools was difficult for political reasons.

Considering these limitations, I decided to conduct the research in the state of Hidalgo. According to the US Department of State, Hidalgo was one of the 13 states (out of 32) for which there was no advisory in effect for travel in 2015, due to its favourable safety conditions. This state has the sixth smallest surface area in the country, which was important when trying to minimize travel time and costs. This also implied that I was able to stay in the capital of the state (Pachuca) and travel every day to the selected schools, without having to spend the night at the municipalities or having to find different means of transportation from the municipalities to the schools. I was also able to agree with the local SEP on the access to the schools prior to the trip to Mexico. Finally, Hidalgo was categorized by the CONAPO as a state with a high marginality level, which was relevant considering the focus of this research on marginalized schools.

Second phase – selection of the schools

During this phase, a group of primary schools in the state of Hidalgo was selected to participate in the research. Specifically, a value-added model was used to select a group of

[35] For instance, travelling from the state of Baja California in the northern region of the country, to the state of Oaxaca in the south takes 4.5 hours by plane; and crossing a state from north to south can take up to 12 hours by car, which will be problematic if there are several schools to visit that are distant from each other.

schools that were adding positive value to the learning outcomes of their students, despite serving a population in disadvantaged socioeconomic circumstances. The analysis was conducted using data from 2,574 primary schools, and resulted in the identification of 296 schools with positive value-added scores. The sample was further reduced to 74 schools after removing schools with 'medium', 'low', and 'very low' levels of marginality, categorized as communitarian or indigenous, with unreliable test results, and with fewer than 30 students. From these 74 schools, a final sample of 18 schools was selected to participate based on their geographical location. See Figure 2.1 for a summary of the research phases.

Full discussion about the selection of the schools, including the use of a value-added measure over raw scores in standardized tests, the specification of the model, the construction of the dataset, the considerations about safety, and a description of the characteristics of the schools in the final sample, are discussed in detail in the next chapter.

Third phase – selection of the classrooms

The third phase consisted of identifying the classrooms (within the 18 schools) where the research would be conducted. In 14 schools, the selection of the classroom was obvious as they only had one classroom serving 6th-graders; in the remaining four schools only one of the 6th-grade classrooms was selected. As the purpose of the exercise was to find engaging teachers and not random teachers within the schools, when there was more than one 6th grade, I asked the principal to select the classroom where the research would be conducted. This considered that the principal, unlike any other staff member in the school, could provide a better-informed opinion about the most suitable participant. Specifically, I asked the principal to select a classroom where students were performing well, enjoyed the lessons, were disciplined, worked on challenging material, had a good relationship with their teacher, and attended regularly, among others (see Table 3.2 for details on the selected classroom).

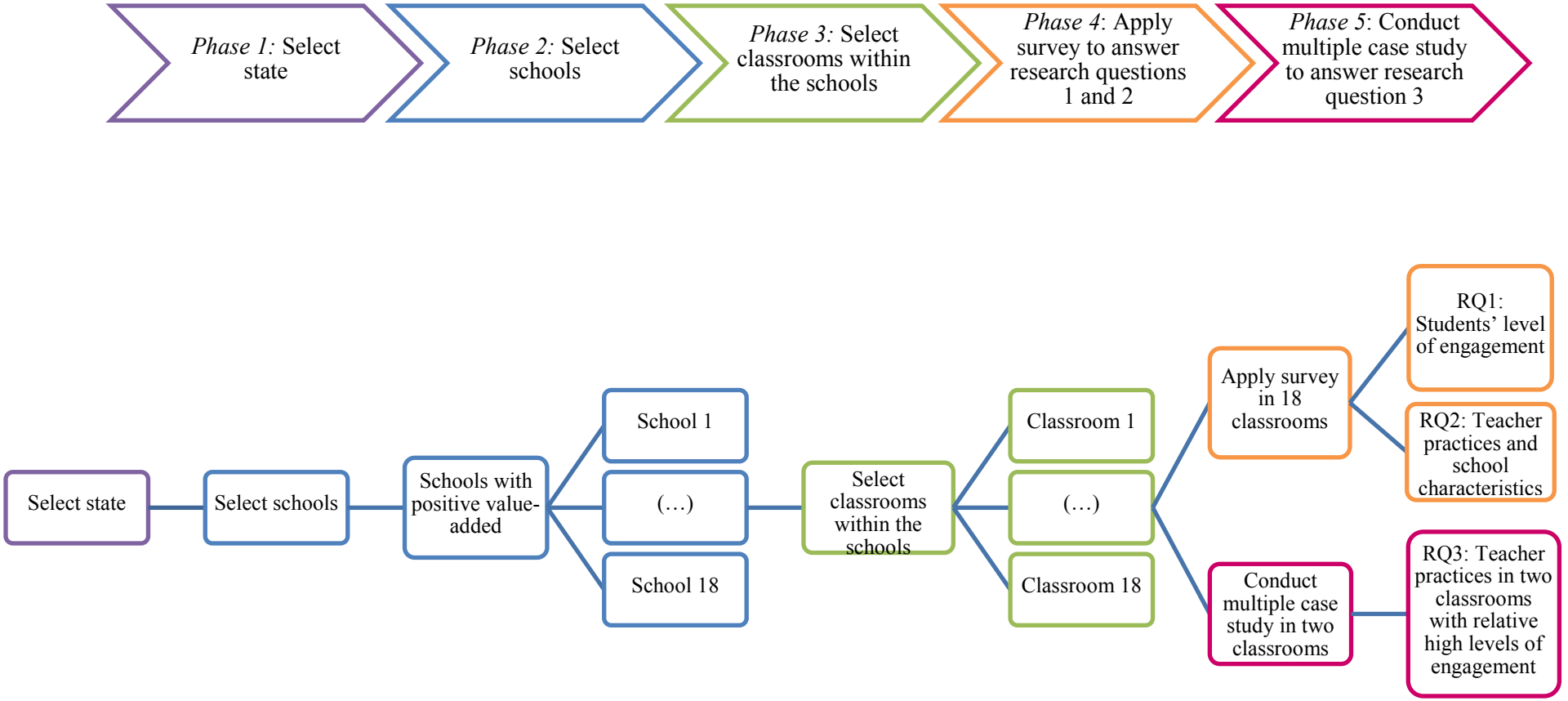

Figure 2.1. Research phases.

Fourth phase – collection and analysis of quantitative data

In the fourth phase, collection and analysis of quantitative data was conducted to answer the *first research question* regarding the students' level of engagement, and the *second research question* on the teachers' practices and school characteristics that promote student engagement in the selected classrooms. Data to answer these research questions was collected using a survey administered to 6th-grade students in the selected 18 schools.[36]

A total of 22 instruments were reviewed in order to find an instrument that was reliable, valid and aligned with the methodological framework of the research. As a result, the 2013 CPS My Voice, My School Survey (MVMS), developed by the University of Chicago Consortium on School Research, was selected to be applied in the schools. The MVMS captures data on cognitive, behavioural and emotional engagement, and on teachers' practices.[37] A comprehensive analysis on the selection of the instrument, its alignment with the methodological framework, its adaptation to the Mexican context and subsequent administration, as well as the reasons to use a survey as opposed to other methods of data collection, and the reason for using an existing instrument, are all presented in the following chapter.

Data analysis

As a result of implementing the survey, evidence containing individual level data on students' engagement was obtained. Given the non-equal interval nature of the data, a Rasch Analysis Model, and in particular a Generalized Partial Credit Model (GPCM) was used to obtain person measures for every student in the sample (315 students in total) for each type of engagement. This data was later computed to obtain an overall score for

[36] Using secondary data analysis to conduct a larger scale research was also considered. However, it was not possible to conduct this type of research as the National Evaluation of Academic Achievement in Schools (ENLACE) did not collect data on cognitive or emotional engagement, and PISA only collects data on engagement from students in secondary education. Using these datasets would have prevented investigating engagement in primary education or following the theoretical framework of the research.

[37] The MVMS captures data on cognitive engagement under the constructs of academic mindsets, academic perseverance, and learning strategies. Data on behavioural engagement is captured under the constructs of rigorous study habits, academic engagement, grit, and peer support for academic work. Emotional engagement is collected under the construct of school connectedness. Data on teacher practices is captured using the constructs of instructional clarity, student–teacher trust, rigour, academic personalism, academic press and discipline.

every school/classroom that includes measures of the three types of engagement. This information enabled me to answer research question one.

In addition, as a result of the analysis two schools/classrooms were selected to participate in the case study, based on the relative high levels of cognitive, behavioural and/or emotional engagement of their students. Initially, a more comparative research design was proposed, where classrooms with high and low engagement were compared in terms of the teachers' practices. Although this was considered a more robust design, it was later discarded given the foreseeable difficulties of gaining access to schools where students reported being disengaged.

Besides from data on engagement, the survey also captured data on teacher practices. Information on school characteristics was also collected *in situ*. Using this data, a cross-sectional dataset was constructed to conduct the analysis. The dataset consists of a sample of 315 students, nested in 18 schools, and contains individual-level data on student engagement and teacher practices, as well as school-level data on schools' characteristics. A hierarchical regression model was conducted (using a random effects model) in order to estimate the association between student engagement and individual and school level variables. Results from the model allowed me to answer the second research question. Full details on the models used to conduct the analysis, the variables included, the implications of having an unrepresentative sample and using a non-experimental design, and the results (and their validity) are discussed thoroughly in the next chapter.

Fifth phase – collection and analysis of qualitative data

In the final phase, collection and analysis of qualitative data was conducted to answer the *third research question* regarding the teacher practices in classrooms where students reported to have relative high levels of engagement. Data to answer this question was collected using semi-structured interviews administered to 6th-grade students, teachers and principals, in the two schools selected to participate in the multiple case study.

According to Yin (2009), a case study is 'an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident' (p.18). Given that the 'case' or primary unit of analysis was the 6th-grade teacher, by using this method it was possible to have a depth of understanding of *how* the correlations found between

engagement and teacher practices were materialized at the classroom level. Additionally, as a result of studying the phenomenon in context, the data collected was not limited to the subject of the study (i.e. the teacher) but also included data external to the case (i.e. contextual data), which helped greatly in explaining the relatively high levels of engagement in the schools.

The aim of conducting a multiple case study rather than a singular case was to explore how different schools' settings and conditions influence student engagement. By implementing a replication design, where the same protocol was applied to *individual* case studies, it was possible to learn (i) that there are different mechanisms through which schools engaged students, as evident in the two schools analysed which have different resources, practices and strategies but similar engagement levels, and (ii) what factors act as enablers and challenges to student engagement.

Following this approach, data from the interviews was examined using a within-case analysis method, where data from each school was analysed (and presented) separately, as opposed to a comparative method, where the similarities and discrepancies across schools are at the centre of the analysis. This decision was made considering that the differences in terms of resources between the two schools were so prominent and the dynamics of each school so unique, that the discussion would be enriched by presenting the promoters of student engagement as the result of a particular context.

The protocol selected to conduct the interviews with teachers was the classroom AIMS instrument, developed by Alysia Roehrig and Eric Christesen at Florida State University. In line with the theoretical framework of the research, this questionnaire captures data on the constructs *atmosphere*, *instruction*, *management*, and *student engagement*.[38] The instruments used in the interviews with principals and students were self-developed. The protocol for students captures data on students' perspectives towards schooling, the student–teacher relationship, and experiences in school, while the principals' interviews focus mainly on investigating their perceptions of the practices of the 6th-grade teacher who might be promoting student engagement.

[38] Although the research question was exploratory in nature, it was preceded by a theoretical proposition that guided data collection and analysis. The proposition, which was enlightened by the literature review, states that in highly engaging classrooms, teachers are implementing particular instructional practices, strategies for classroom management, and promoting caring teacher–student relationships, which subsequently promote achievement.

Data analysis

As a result of implementing the interviews in both schools, 50 hours of recording containing data on teacher practices and contextual factors was obtained. Additional data was collected in the form of descriptive notes, accounts of school visits, and notes on informal observations. Thematic analysis of interview data was conducted using the software Nvivo. Given that the purpose of the analysis was to understand how the practices included in the econometric model were materialized at classroom level, deductive analysis was conducted using as nodes the practices/constructs included in the student survey. In addition, inductive analysis was also adopted in order to identify themes emerging from the data, which were not anticipated at the beginning of the study.

A comprehensive analysis on the selection of the instruments, their validity and reliability, the use of interviews as opposed to other methods of data collection, the limitations of using interviews, the use of semi-structured interviews, the adaptation of the instruments to the Mexican context and subsequent administration, as well as the characteristics of the data collected, are all presented in the introduction of the chapter presenting the qualitative analysis.

SECTION III – Access to Data and Schools

Access to data on test scores and permission to use existing instruments to collect quantitative and qualitative data

In order to conduct the value-added model, I needed to gain access to the test scores in Mathematics and Spanish on ENLACE, of the primary schools in the state of Hidalgo (i.e. 3,227 schools) from 2009 to 2013. The data was formally requested from and provided by the Educational Policy Planning and Evaluation Unit at the SEP. This dataset also contained data on the marginality level of the localities where the schools were located. Having access to school level data, on test scores and marginality levels allowed me to conduct the model.

Later on in the research process, I needed permission to use the instruments selected to collect both quantitative and qualitative data. Specifically, I asked the University of Chicago Consortium on School Research for permission to use the survey on student engagement. After I explained the purpose of my research, my theoretical understanding

of student engagement, and the target population of my research, the Senior Manager for Survey Research, Rachel Levenstein, granted the permission to use it subject to citing the Consortium as the source. Similarly, after discussing my research project with Alysia Roehrig and Sara Kersey, developers of the two instruments selected to conduct the interviews, they granted permission to use them. There were no costs involved in the permission to use the protocols.

Access to schools to conduct the survey

As mentioned before, I established a dialogue with the education local authorities prior to my arrival to Mexico. Specifically, I discussed the purpose of the research and the possibility of accessing the selected schools with an official at the SEP in Pachuca via phone and email. Besides these communications, I sent the SEP a detailed document containing a description of the research, asking formally for permission to access the schools.

Once in Mexico, I attended a meeting with the officials at the SEP.[39] The interaction with them was smooth and open, and from that first meeting they were committed to facilitating my access to the schools. As a result of the meeting I obtained an authorization letter from the SEP, that I was required to present to the principals on my first visit, which stated I had permission from the government to conduct the research. This letter was also sent by the SEP to the supervisors of the 18 schools, who were in charge of informing the principals of the schools of my visit and the proposed day and time to conduct the survey.

When I arrived at the schools for my first visit, most of the principals did not know about it. Even though my visit to the SEP was conducted two weeks before the visit to the first school, some supervisors were not able to communicate the information on time, as in these highly isolated communities access to the Internet (and even phone calls) is limited.

[39] Given that I am non-Mexican born, with no experience working in educational projects in Mexico, I made a conscious effort to prepare this first meeting with the SEP. In general, I was concerned that authorities perceived me as a person with a lack of knowledge about the functioning of the Mexican education system, who was meddling with their operation and the operation of the schools. To approach this concern I familiarized myself with the Comprehensive Reform of Basic Education, the role of the central and local authorities in the governance of schools, major features of the Mexican education system (e.g. school autonomy, modalities and shifts), the compensatory programmes that were currently in place, the role of the newly established National Institute for Educational Assessment and Evaluation, the performance of the state in the national standardized test, and performance of the country in international assessments.

Surprisingly, the lack of previous knowledge about my visit was not an impediment to conducting the surveys.

Once I explained the reason for my visit, informed that participation was voluntary,[40] that the school and individual answers would be anonymized, and showed the principals the authorization letter from the SEP, 16 of the 18 principals allowed me to conduct the survey that day, as planned (some of those 16 principals knew about my visit). In the other two schools, principals gave me a day and time to return and conduct the survey.[41] Other factors that might have influenced the principal's decision to let me conduct the fieldwork, without previous notice, was the fact that I explained in detail that the schools chosen for my research had done an exceptional job of contributing to the learning of their students and that I wanted to explore that further.

Although some of the principals were curious about the research and mentioned they would be happy to hear about my findings, none of them made participation in the study contingent on receiving feedback from me. Even though I informed students that participation in the survey was voluntary, none of the students in the sample refused to participate (for further detail see Section II: Data Collection' in Chapter 3).

Access to schools to conduct the case study

Although the principals agreed on the participation of the schools in the survey, I considered it necessary to renegotiate the participation with the schools selected for the case studies. This was the case as I did not want to impose the permission granted by the SEP, as the school involvement on this stage would imply prolonged engagement on their part, for example providing weekly access to participants for two months, and making schedule arrangements for the teachers and students to be able to attend the sessions.

Once I explained that the invitation to participate in this stage was due to the positive results of the students in the survey, both schools were happy to continue being part of the research. Even though the principals and teachers agreed to participate, I reminded them that during this stage participation was also voluntary, that they could withdraw at any point, that the answers were confidential, and that the school and individual answers

[40] That is, that I could withdraw the data I was about to collect from my research at any point.
[41] Principals in these schools explained they had tight schedules that day, and that they needed to plan my visit. One of these schools participated in the case study.

would be anonymized. An important remark regarding access to the schools, is that although most studies suffer from selection bias, the selection bias in this research is likely minimal, given that all schools (i.e. principals, teachers and students) invited to participate agreed to do so.

Staff members and students in both schools were welcoming and remained open and transparent throughout the research. An example of this favourable environment is that in both schools I was regularly invited to observe teachers' meetings, lessons and extracurricular activities. In one of the schools I was invited to the celebration of the teachers' day and to the graduation ceremony. I participated in all activities that I was invited to be part of and engaged in conversation with students and staff members, which helped me develop and maintain trusting relationships with all participants. However, I was careful to keep a distance so I did not develop a strong relationship with participants, which could interfere with the research.

My perception of both schools was that the principals and teachers were confident about their practices, and I made clear my intention to learn from their exceptional experiences, so that they did not see my presence and research as a threat, but instead as an opportunity to collaborate and participate in a research project and learn from their own practices.

Prior to the start of the interviews, I asked the principals about the procedure to gain consent from parents before involving their children in research. However, both head teachers assured me that as I had consent from the SEP and from the school, it was unnecessary to contact parents. I asked permission to take photos during the interviews and photos of the 6th-graders (to help me learn their name before the interviews), and the principals gave me consent.

The fact that I presented myself as a postgraduate student with a deep interest in education in Mexico, created a common ground with both teachers, as they also aspired to conduct postgraduate studies in the future and were obviously as interested as me in education. Although teachers were not required by the school to remain beyond the teaching hours, it was not unusual to see them undertake duties after the school day was over. Thus, they offered to meet with me in the afternoons and even during the weekends. Both teachers were generous with their time, open about their experiences, and fully committed to the research during the entire fieldwork. I was as flexible as possible with the timeline and

asked teachers to schedule the interview sessions with them and their students at their convenience.

The physical access to schools was considered an important component of the planning phase of the research. This was the case, as I was extremely cautious about my safety during the fieldwork. Three aspects of the trip to the schools were cause for concern: (i) the majority of the schools were located in highly isolated areas and I would make the trip alone, (ii) landslides caused by poorly-maintained roads were common in the mountainous area where the research was conducted, and (iii) mobile phone reception did not work well in rural areas (i.e. I would be unable to communicate in case of an emergency). In order to approach these concerns, I hired a well-known, experienced driver who drove me to the schools, waited for me to conduct the fieldwork for the day and took me back to my house, located in the capital of the state. Hiring him was crucial for my safety and for the successful completion of the fieldwork.

SECTION IV – Ethical Considerations

This section discusses the ethical concerns and challenging situations that arose during the study. In this research, *ethics* refers to the conformity to a set of principles, which includes a commitment to participants' rights, respect for the participants and commitment to knowledge (Robson, 2011). Therefore, and considering the potential harm, stress, pressure or anxiety that participants might face as a consequence of the research, I familiarized myself with, and followed, the Ethical Guidelines for Education Research of the British Educational Research Association.[42]

Despite my efforts to foresee possible ethical issues and respond to them in advance, I faced a number of challenging situations during the research. The first challenge I faced was related to the participants' knowledge of their role in the research. For me, it was important that principals and teachers knew in advance of my visit about the invitation to participate and the purpose of the research, so they could make an informed decision about whether or not they wanted to be part of it, and consider the possible advantages for the school of having data on student engagement. However, as mentioned before, in some of the schools the principals did not know about the research or my visit.

[42] The guidelines provided me with useful information on topics such as voluntary informed consent, right to withdraw, detriment arising from participation in research, privacy, and disclosure, among others.

Given that on some occasions I had to travel up to four hours to reach the schools, I made the decision not to cancel immediately the data collection in the schools that did not know about the visit, and instead provided as much detail as possible about the research, and asked permission to conduct the survey as planned. Despite these efforts to communicate effectively and in a short amount of time, the purpose of the research, the mechanism through which I selected the schools, and the role of the participating schools, the decision to participate might have been hastily made by the principals.

In addition, I was particularly interested in ensuring that students participated voluntarily in the research. This was the case because Mexican students are inclined to obey the instructions of authority figures and rarely raise their voice against such instructions, and I wanted to give students the opportunity to make the decision on their own. Even though I could have equated the approval of the head teacher to the consent of the students, I made clear to the students during the introduction to the survey that they could agree to participate, or not, without any adverse consequences. I also agreed with them on a sign that they could use to let me know easily if they did not want to continue filling in the survey. Although none of the students refused to participate, and all of them turned in the survey, I thought this first approach with the students was crucial to show them my respect and to start building a rapport with them, in case I returned to the school to conduct the case study.

Another challenge I faced was related to the classroom management while administering the survey in two of the 18 schools. Although teachers in other schools left the classroom while the students completed the survey with no consequences on the students' behaviour, in these classrooms the absence of the teachers caused major disruptions.[43] That is, students tried to copy each other's responses, talked, disturbed their peers, asked for permission to use the toilet (sometimes in groups of five) and got distracted by other students who were playing outside the classroom.

Although at the beginning I did not think I had the authority needed to discipline the students, as I was an outsider visiting for the day, I soon realized I needed to restore the sense of order if I wanted to have good quality data. I was especially concerned with the fact that students were trying to copy each other's answers. In order to prevent this, I asked the students involved to move their chairs to the front row and away from each

[43] Teachers were asked to decide whether or not they would stay during the application.

other, and I stopped the application for a moment to remind the entire group that there were no right or wrong answers, and that I was interested in the opinion of each of them, and therefore copying the answers of their peers was pointless.

I decided to let the students go to the toilet during the survey but in groups of two. To my surprise, when their turn arrived some of the students did not want to go to the toilet anymore, which indicated they did not want to go in the first place and were just trying to leave the classroom. Also, major disruptions occurred when some of the students finished the survey and started talking and distracting their peers. Thus, in order to have a quiet environment for the students who were still working on their surveys, I decided to ask all students who had finished to leave the classroom, and go and play outside, as I noticed students from other grade levels were already playing in the yard.

I also faced ethical concerns while conducting the interviews with students. Although all students in one of the schools agreed to participate in the interviews, an alarming event occurred when two girls (in different sessions, as they were assigned to different groups) started crying profusely when I asked them the first questions. These events caught me completely off guard, so my first reaction was to ask them if there was something wrong (which they denied), and then I asked them if they wanted to leave the room and come back when they felt better, which they did.

While they were gone I asked the other students if they knew why they were crying, and all of them agreed that they were particularly shy, that it was uncommon for some of them to interact with individuals outside their community, and that the interaction with me might have upset them. They also commented that the teacher had been trying to make these two girls not cry during their presentations and be less shy, but that he had only succeeded in his efforts with one of them. Therefore, although I was still worried about them, as I did not know if there were other more serious problems triggering this behaviour, it was important to know this was a common occurrence and not an isolated response to any particular action during the interview. When the girls came back to join the discussion, I decide not to put pressure on them when they were uncomfortable sharing their experiences, I told them they could have breaks when needed, and assured them of the value of the experiences of all students.

At the end of the day I told the teacher about both incidents, and he confirmed what the students in the group had told me. After that first visit I focused on building a rapport

with the students, for example by staying in the afternoons to watch them practice an upcoming dance presentation. By the second session these students were less reluctant to participate (in fact one of the students participated normally) and neither of them cried again in a session.

In another instance, during the interviews in one of the schools, girls seemed to have feelings of superiority towards the boys. This was evident in all interview sessions, where at least one of the girls was disrespectful to the boys in that group. Specifically, the girls made fun of the boys while they were answering; gave them instructions such us speak louder or sit correctly; made gestures at them while they were answering to encourage them to talk or to let them know if they agreed with their comments. Interestingly, during all sessions, not one boy was disrespectful to the girls, or let them know their impressions about their answers.

During these incidents, I focused all my attention on the boys (looking directly at them and taking notes with special diligence), encouraging them to continue with their responses and assuring them what they were saying was very important to me. Another incident occurred when some boys in the same school tried to engage in conversation with other boys seated next to them during the interview. My strategy was to take note of their names to seat them in different places the next session, and asked them to remain focused, to which they responded positively.

SUMMARY

This chapter discussed and justified the use of a mixed methods design to answer the research questions, which were both descriptive and exploratory in nature. Thus, it described the decisions and challenges I faced in each of the phases conducted to answer the research questions. Although the chapter presented the methods used in the research, Chapters 3 to 6 are devoted to providing full details on the quantitative and qualitative methods used, and to presenting the findings that emerged from the implementation of both methods.

CHAPTER 3: STUDENT LEVEL OF COGNITIVE, BEHAVIOURAL AND EMOTIONAL ENGAGEMENT

This chapter addresses the *first research question*, which enquires about the level of engagement of students in the 18 selected classrooms. The objective of this enquiry is to identify two classrooms with high levels of engagement where the case studies could be conducted. Given that the same instrument was used to answer the first and second research questions, this chapter also addresses the selection, adaptation and application of that instrument.

The chapter is divided into four sections. The first section discusses the process that led to the selection of the 18 schools that were part of the research. The second section deals with the data collection process and includes a discussion on the selection of the instrument to gather quantitative data, and its adaptation to the Mexican context. The third section describes the data collected, and discusses the implementation of a Rasch model. The final section presents the data analysis and the answer to the first research question.

SECTION I – Selection of the Schools

In order to identify schools that were contributing to student performance, it was crucial to use a measure that reflected the real performance of the school and not other factors that were beyond the school's control, such as differences in student composition. Specifically, there was a concern that if raw measures such as average scores on standardized tests were used to select the schools, those measures would not take into account other factors that influence achievement, such as the socioeconomic background of the student or the fact that a student's attainment at a given point is a function of his/her cognitive development prior to school entry, among others (OECD, 2008).

This concern is based on vast literature that points out the need to contextualize schools' results in order to conduct fair comparisons between schools' examinations. In general, the literature suggests that contextualized data reflecting the students' abilities, attainment, prior achievement and socioeconomic circumstances should be used to determine the extent of the differences in students' performance that may be attributable to differences in the effectiveness of the schools they attend (Gray, Jesson, & Jones, 1986;

Gray, Jesson, & Sime, 1990; Saunders, 1999; Goldstein, Huiqi, Rath, & Hill, 2002; Ray, 2006; Chetty, Friedman, & Rockoff, 2014).[44]

Having this in mind and in order to establish whether schools in the sample added more or less value than average to the learning outcomes of their students, I decided to use a value-added model to identify the schools. Value-added models attempt to overcome the problems described above by incorporating student prior attainment measures and contextual characteristics to the model, which enable a disentangling of the effects of various factors on student outcomes. Particularly, the model isolates the school's contribution to student learning from other factors associated with learning, by controlling for variables influencing the school results.

In order to conduct the analysis, I used data from ENLACE.[45] Specifically, I used the mean score from the 3rd grade of each school (using the dataset containing the results for the state of Hidalgo) for the years 2009, 2010 and 2011 in both Mathematics and Language to account for prior achievement; and the mean score from the 6th grade of each school for the years 2011, 2012 and 2013 in both Mathematics and Language to measure current achievement level (see Appendix 1 for a detailed explanation on how scores are calculated by the SEP).[46] Furthermore, socioeconomic marginality measures (i.e. school type and marginality levels) were also used in the estimation of the model to control for contextual characteristics that influence student performance (see subsection 'Conceptual framework' in Chapter 2, for a description of the marginality levels).

Conducting a value-added model

The aim of conducting the model was to identify the schools in the sample that added more and less value than average to the learning outcomes of their students. However, given that the original dataset for the year 2013 contained data on 3,227 primary schools

[44] For example, McCall, Kingsbury, and Olson (2004), who conducted a correlational study using data from the US for the years 2002 and 2003, provide evidence of the difference in estimations based on student achievement growth and based on student attainment. According to the authors, the correlations between progress in students' scores in both Reading and Mathematics and the percentage of students eligible for free or reduced meals, was much lower than the correlation between scores' means (in both Reading and Mathematics) and free school meals status (i.e. a correlation of -0.02 to -0.24 and of -0.51 to -0.59 respectively in Mathematics, and of -0.07 to -0.27 and -0.54 to -0.66 in Reading).

[45] See Appendix 2 for details on ENLACE.

[46] This research uses data ending in 2013, and not 2014 (the year prior to the fieldwork) because ENLACE was administered for the last time in 2013. During the year 2014 there was no application since the government was preparing a new set of tools that will be administered starting in the year 2015.

in the state of Hidalgo, and that the analysis was conducted using only data from 2,574 schools, the sample selection process is discussed in detail below. It is important to mention that the dataset of 2,574 schools includes schools located in communities in all marginality levels (i.e. high, very high, medium, low and very low), and schools in all modalities.[47]

In order to estimate the value-added of each school, a regression analysis was performed. The regressions were conducted using school level data given that individual level data was not available. As seen in the regressions presented below, the objective of the analysis was to obtain the mean difference in test scores for each school in 6th grade, considering socioeconomic circumstances (i.e. marginality and school type) and students' prior achievement (i.e. 3rd-grade scores).

Regression used in the analysis using data on Mathematics test scores:

$$Y_{mts} = \alpha + \theta Y_{mt-2s} + \beta_n Z_{ts} + \mu_s$$

(*equation 1*)

where,

Y_{mts} is the score in Mathematics (m) at time t in school s; α is the usual regression intercept; Y_{mt-2s} represents the score in Mathematics (m) at time $t-2$ in in school s; and θ is the respective coefficient for the vector; Z_{ts} is a vector containing the covariates marginality and school type, at time t in school s; β_n is the coefficient for these two vectors; and μ_s is the *effect* of school s on the score. Specifically, three regressions were performed using this model, in the first one t is the year 2013 and t-2 is 2011; in the second t is 2012 and t-2 is 2010; and in the third one t is the year 2011, and t-2 is 2009.

[47] The public education system in Mexico provides educational services at the primary level in three different modalities, namely: communitarian, indigenous, and general. *Community schools* account for 0.8 per cent of the total primary schools in the country and are targeted at small communities, with the objective of promoting education among population in highly deprived contexts. Communitarian instructors are young individuals, usually native of rural communities that have graduated from secondary school. After seven weeks of initial training they provide educational services during one school year (or two), after which they receive a scholarship to continue their formal education. At least three-quarters of community schools are located in rural areas. *Indigenous schools* account for 5.7 per cent of the total primary schools in the country. They are characterized by bilingualism (i.e. one indigenous language is taught), and at least half of them are located in rural areas. *General schools* are public schools, which serve students in both urban and rural areas and provide services to the majority of students in the country (INEE, 2012) (see Appendix 2 for further details on the Mexican Education System).

The same model was used to perform three additional regressions, using data on test scores in Spanish.

Construction of the dataset

In order to carry out the regressions, I needed a dataset with complete information for all schools, on their characteristics and on the test scores in Mathematics and Spanish. As mentioned before, the original dataset from 2013 contains 3,227 schools and the last version was reduced to 2,574. This happened because in the process of building up the final dataset, 20.2 per cent of the schools were dropped from the sample due to missing data. The logic behind the construction of the dataset was to merge one by one the individual datasets containing the information needed to carry out each of the regressions described above. Full details of the process undertaken to obtain the final version are described below.

Preparing the dataset for regressions one and four

In order to perform the first regression, the first variable needed was the mean score in Mathematics in 2013 for 6th grade. For this year, the original dataset had a total of 3,227 observations. This dataset not only contained the scores of 6th-graders in Mathematics, but also in Spanish. Given that the scores of 6th-graders in Spanish for the year 2013 were needed in regression four, it was necessary to drop not only the schools with missing data on the scores in Mathematics, but also the schools with missing data on the scores in Spanish for the year 2013. As a result, the original dataset containing data on 3,227 schools was reduced to 3,008 observations.

The second variable needed was the mean score in Mathematics in 2011 for 3rd grade. The original dataset for the year 2011 (for 3rd-graders) had a total of 3,205 observations. After dropping the schools with missing data on Mathematics and Spanish scores, the dataset for the year 2011 was reduced to 3,037 observations. Once the data selection was finished for the years 2013 and 2011, both datasets were merged. This means that in order to perform regression one, it was necessary to construct a new dataset containing the mean score in Mathematics in 2013 for 6th grade, and the mean score in Mathematics in 2011 for 3rd grade, for every school.

In order to merge the datasets from the years 2013 and 2011, each of the 3,008 observations in the dataset for the year 2013 were matched with the 3,037 observations in the dataset for the year 2011. Considering that not all the schools in the dataset for the year 2013 were found in the dataset for the year 2011, the 'final' dataset was reduced to 2,829 observations.

Preparing the dataset for the remaining regressions

A similar procedure was followed to construct the datasets for the rest of the regressions. Once the dataset for regression one and four was merged with the datasets needed to conduct regression two and five, the sample was reduced to 2,706 observations. Once this sample was merged with the datasets needed to conduct regressions three and six that final dataset was reduced to 2,574 observations.

Schools with positive value-added scores

Once the dataset containing information for all schools was completed, the six regressions mentioned above were conducted. Then, in order to determine the effect of each school on the learning outcomes of their students, the residuals for each regression were estimated. A full discussion on the theory of residuals and how they are calculated can be found later in this chapter, in the section, 'Fixed vs. random effects model'.

The results from a correlation matrix between the residuals shown in Table 3.1 indicate that although the correlation of the residuals for a given school in a given year across subjects is high (i.e. the correlation between Mathematics and Spanish in 2013 is 0.81, in 2012 is 0.80 and in 2011 is 0.7), the correlation between years is less strong. These results indicate that schools with good results in one year are good across subjects, but over time their results tend to fluctuate.

Considering that the school effect is captured by the residuals, and that the aim of this exercise was to identify the schools in the sample that add more value than average to the learning outcomes of their students, the next step of the analysis was to identify the schools with *positive* value-added scores and to rank them. Using the dataset that contained the residuals from the 2,574 schools in each of the six regressions, I identified 296 schools with *positive* residuals in the six regressions. Then, these 296 schools were ranked by the residuals in each regression and finally a rank average was computed for each of the schools.

Table 3.1. Correlation between residuals.

Residuals by regression	Residual R1Maths–2013	Residual R2Maths–2012	Residual R3Maths–2011	Residual R4Spanish –2013	Residual R5Spanish –2012	Residual R6Spanish –2011
Residual R1Maths–2013	1.0000					
Residual R2Maths–2012	0.2987	1.0000				
Residual R3Maths–2011	0.2179	0.3346	1.0000			
Residual R4Spanish –2013	0.8187	0.2488	0.1780	1.0000		
Residual R5Spanish –2012	0.2190	0.8045	0.2908	0.2418	1.0000	
Residual R6Spanish –2011	0.1706	0.2416	0.7530	0.1921	0.2580	1.0000

Final selection of schools

As mentioned at the beginning of this section, the original sample, as well as the sample from the 296 schools (i.e. those with positive value-added scores), contains data from schools located in communities with high, very high, medium, low and very low levels of marginality. Since the purpose of the analysis was not only to identify schools that added more value than average to the learning outcomes of their students, but crucially to identify schools that did it despite serving students in disadvantaged socioeconomic circumstances, it was important to remove from the sample schools with *medium*, *low*, and *very low* levels of marginality. This reduced the sample to 136 observations. It is important to notice that by doing this, all schools categorized as *private* were automatically dropped from the sample. This is the case because the most affluent students tend to attend *private* schools.

An important consideration regarding the selection of the final 18 schools is that although the focus of the analysis was placed on identifying schools serving students in disadvantaged socioeconomic circumstances, I decided to exclude from the sample

schools categorized as *communitarian* and *indigenous*. This decision was made based on safety reasons. Since communitarian and indigenous schools provide educational services in highly isolated rural areas, I was deeply concerned about my safety during the trips to the schools and once I arrived in the community. It is important to consider that schools in these modalities were created to cater for students in isolated communities that otherwise would have tremendous difficulties accessing *general* schools.

In addition, I considered problematic conducting the fieldwork in indigenous schools, as in these schools, instruction was provided in Spanish and also in native languages that were unknown to me. The fact that I was not familiarized with the indigenous culture (which plays a crucial role in daily activities of the classroom) also prevented me from conducting the research in schools under this modality. However, it is important to notice that given the difficult socioeconomic background of the students attending communitarian and indigenous schools, the decision to drop these schools from the sample implied that the most marginalized students were excluded from the study.

Having these considerations in mind, a total of 28 indigenous schools (i.e. 9.4 per cent of the sample) and two communitarian schools (i.e. 0.6 per cent of the sample) were removed, which reduced the sample to 106 observations. Thus, the remaining schools were *general* schools located in communities with *high* and *very high* levels of marginality.

Thereupon, I removed from the sample schools with unreliable test results, as defined officially by the SEP. In particular, I considered it important to remove the schools where more than 30 per cent of the students had unreliable results in at least one of the years for which data was used (i.e. 2009, 2010, 2011, 2012 and 2013). As a consequence, a total of 11 schools were removed from the sample. The analysis was conducted using yearly data provided by the SEP on the number of students at each grade level with unreliable results.

According to the SEP, students' responses labelled as *unreliable* indicate an unlikely pattern of answers to items among the students in the same classroom. Although it is not possible to argue that students in these classrooms cheated during the test, the SEP argues that it is possible to say that statistically, the results of the schools where more than 30

per cent of the students have unreliable results are less reliable than the results of schools with low levels of unreliable results.

In addition, I removed from the sample 21 schools that enrolled fewer than 30 students due to small sample size problems. Once these schools and schools with unreliable results were dropped, the sample was reduced to 74 observations.

The next step was to select the final schools based on their value-added scores. Since these 74 schools were ranked on their value-added scores, a first approximation to the data was to examine the top 20 schools in the ranking. When this exercise was performed, a very interesting phenomenon was found: the majority of schools at the top of the ranking were clustered in a very specific geographical area in the northern part of the state called La Huasteca. Given that these schools were at the top of the ranking and were clustered in the same area, I thought they should be selected to participate in the research.[48]

Notwithstanding, when I shared this information with staff from the SEP, as well as with people currently living in the state of Hidalgo, they all considered it was not safe to conduct the fieldwork in this area. Their main argument was that La Huasteca was six hours away from the capital of the state (i.e. Pachuca) and part of a mountainous region difficult to access and therefore dangerous. In addition, schools were not located in the main towns, such as Huejutla de Reyes and Tlanchinol, but in even more remote localities. In sum, it was not considered safe that I spend months alone in this highly isolated area (see Appendix 3 for a map of the state which shows the location of the schools).

Given the safety issues raised, I changed my selection strategy and based it on geographical location from within the group of 74 schools with *positive* value-added scores. A safe location was defined as schools that were located no more than two hours away from Pachuca or from the main towns, Tulancingo and Actopan. Using this criterion, a total of 48 schools were removed, and the sample was reduced to 26 observations.[49] Following discussions with the SEP, 11 further schools were removed

[48] Specifically, the schools were located in the following municipalities: Huejutla de Reyes, Lolotla, Tianguistengo, Huazalingo, Atlapexco, Tlanchinol and Molango de Escamilla.
[49] It is important to mention that until this point the selection of the schools was done while I was in the UK and the consultations with the SEP were done by phone or email.

from the sample based on safety reasons and a total of 15 schools were first selected to participate in the research.[50] Given that the goal was to select a total of 18 schools, I reviewed again the list of 296 schools with positive value-added scores and realized that although schools TH7844, AI2440 and XC0947 were categorized as schools with *low marginality* in the years 2010 and 2011, they were categorized as schools with *high marginality* in the year 2013. Once I corroborated that these three schools were in fact serving a disadvantaged population and that they met the other eligibility criteria they were also selected to participate in the research.

An important consideration about applying remoteness and safety criteria to select the schools is the introduction of selection bias. Similar to the decision to exclude indigenous and communitarian schools, the decision to drop schools located in the most remote areas implied that the most remote and marginalized students were excluded from the study.

Besides selecting these 18 schools, I also selected two additional schools. School GX2247 was included in case the access to any of the chosen schools failed,[51] and school HM7071 was selected to conduct the field test.[52] Finally, from the 18 schools selected to participate in the research, it was not possible to conduct the survey in one of them (i.e. school ES1508) due to a landslide that occurred days before the visit, and therefore it was necessary to include school GX2247 in the research.[53]

Characteristics of the selected schools

As mentioned before, the final schools were selected from a subsample of schools located in localities with *high* and *very high* marginality levels. However, the final 18 schools are located only in localities with *high* levels of marginality, and they are all *rural*. Moreover,

[50] For instance, schools SM6671 and JC8483 were removed from the sample because they were located in extremely isolated areas and the trip was not considered safe; other schools were removed as they were not serving students in marginal areas (although the data indicated otherwise). In other cases, access to the schools was difficult due to landslides that had recently occurred. Finally, the SEP strongly advised not to go to some of the schools due to political problems in the municipalities where they were located.
[51] This school was not included in the main sample because in spite of meeting most of the criteria, it only has 28 pupils.
[52] This school was selected to conduct the field test of the survey, because although it served students in a marginal area and it was a general school with more than 30 students, its test results were not reliable for some of the years.
[53] A final remark on the school selection is that given that the data used to select the schools was from the years 2009 to 2013, and the fieldwork was conducted in the year 2015, it was important to make sure the selected schools were still providing educational services when the fieldwork was conducted (i.e. in the academic year 2014–2015).

all selected schools are *general* and they operate in the morning shift, except for school XC0947, which serves students on the afternoon shift.[54]

From the 18 schools in the sample, seven are part of the full-time programme (i.e. schools with extended schedules that serve students for seven hours a day) and 11 serve students with a regular schedule (i.e. four and a half hours a day). During the extended schedule, schools in the full-time programme are encouraged to work in six work lines that include fostering learning of curricula contents, didactic use of information and communication, learning of additional languages, art and culture, healthy life, and recreation and physical development. The full-time programme also grants a fixed yearly stipend that must be used in training and monetary aids for principals, teachers, and support staff members; meal services; and conditioning and equipping of school spaces, among others (see Appendix 4 for full details on the full-time programme).

Another important difference between the schools in the sample is that there are some schools that operate with a multi-grade structure while others operate under a complete organization scheme. Schools with complete organization are the ones with one teacher per classroom. In primary schools where six grade levels are offered, there are a total of six teachers and one principal in the school. On the contrary, in multi-grade schools one teacher is responsible for teaching more than one grade level at a time. As a case in point, to serve students from 1st to 6th grade there can be a total of three teachers in the school (including or plus the principal), which means that one teacher is responsible for teaching 1st and 2nd grade, another teaches 3rd and 4th grade, and another teaches 5th and 6th grade.

Nonetheless, it is important to clarify that in this research a *multi-grade* school is one in which at least one teacher in the school is responsible for teaching more than one grade level. Thereby, students can be enrolled in a school with a multi-grade structure, but still be part of a classroom where one teacher is responsible for one grade only. As a result, the school is categorized as a multi-grade school, even though the students in 6th grade

[54] Schools on the morning shift operate from 8:00 a.m. to 12:30 p.m. with a break of half an hour, while schools on the afternoon shift operate from 2:00 p.m. to 6:30 p.m. Schools with afternoon shifts are part of a double shift scheme, where different cohorts of students use the same building and have the same academic curriculum. Double shift systems in Mexico operate in areas where enrolment rates are high and there is need to reduce overcrowding.

in that school do not share the classroom (and teacher) with any other grade level. This is the case of schools CO8304 and PJ8974 in the sample.

The schools in the final sample are also distinctive at the classroom level. In some of the schools/classrooms the 6th-grade teacher has a *Licensure* (also known as *endorsement*) while in others the teacher is a *Normalista*. A teacher with *Licensure* refers to a teacher who, in addition to a bachelor's degree in Education, also holds a specialty area licence. For instance, a teacher can have a Bachelor of Science in Teaching from a state-approved teaching school (i.e. Escuela Normal Superior) and a Licensure in Science. On the other hand, the term *Normalista* refers to a teacher who also attends a state-approved teaching school (Escuela Normal), but only has general content knowledge (in different subject areas and pedagogy).

Another important characteristic of the schools in the sample are the years of experience of the staff members. For this reason, data on the years of experience of the 6th-grade teachers was collected, coupled with data on the years of experience of the head teachers. However, an important distinction in this regard is that the years of experience of a teacher refer to the total number of years he/she has been teaching in any school; while the head teacher's experience refers to the years the head teacher has been the head teacher in that particular school. Likewise, data was also collected to determine if the school had in place a library, a computer laboratory and/or a cafeteria for the students. In order to provide a full description of the details described above, Table 3.2 presents the standard characteristics of the selected schools.

Table 3.2. Characteristics of the schools

School ID	# of students in the classroom (6th grade)	# of students in the school	Complete organization (√) vs. multi-grade	Full-time (√) vs. 4-hour school day	Kilometres from locality to state capital	Cafeteria (√)	Library (√)	Computer lab (√)	Head teacher's years of experience	6th-grade teacher's years of experience	Qualification of the 6th-grade teacher: Licensure (√) vs. Normalista
CO8304	11	71	x	x	50.9	x	x	x	9	14	√
AI2440	23	127	√	√	4.9	√	√	√	22	6	√
PJ8974	20	105	x	x	66.1	x	√	x	16	18	x
US7450	11	33	x	√	136	√	√	√	20	3	√
BN2124	12	52	x	x	37.4	x	√	x	10	6	x
JM5574	12	76	x	x	48.8	x	√	√	14	13	√
FD0907	30	180	√	x	62.9	√	√	√	1	18	√
DC3398	13	107	√	x	91.4	√	√	x	14	22	√
EL7043	31	114	√	√	49.7	√	√	√	1	16	√
AN4053	15	227	√	x	95.4	x	√	x	8	17	x
GX2247	6	56	x	x	94.1	x	√	x	7	25	x
XC0947	39	518	√	x	42.7	x	x	x	6	16	x
TH7844	20	207	√	√	30.9	√	√	√	20	21	√
KJ9193	21	162	√	√	133	√	√	√	21	25	√
ZB1295	10	55	x	√	61.1	√	√	√	3	24	x
HX3788	17	111	√	√	59	x	√	x	6	12	x
VQ4907	15	183	√	x	111	x	√	√	30	10	x
LR6576	13	70	√	x	98.4	√	√	x	1	26	√

Note: Data collected from the principals during fieldwork.

Summary of the schools' characteristics

From the 18 schools, 11 have a complete organization structure and seven have a multi-grade structure. Multi-grade schools have on average 64 students, while schools with complete organization have on average 182 students. Multi-grade schools have on average 12 students in 6th grade, while schools with complete organization have on average 22 students in 6th grade. The average years of experience of the 6th-grade teacher in both types of school is similar: 15 in multi-grade schools, and 17 in schools with complete organization. Likewise, the average year of experience of principals in multi-grade schools is 11 and in school with complete organization is 12. In four of the five schools where the head teacher has more than 20 years of experience, the school operates under a complete organization scheme. School in both types of scheme are located on average 70 kilometres away from the capital.

There are seven schools participating in the full-time programme, and 11 schools that are not part of the full-time programme (i.e. students have a school day of four and a half hours). The years of experience of staff in both types of school are similar, the 6th-grade teachers in schools with full-time programmes have on average 15 years of experience, while the 6th-grade teachers in schools that do not have a full-time programme have on average 17 years of experience. As for the principals, the average experience is 13 years for those in schools that are part of the full-time programme, and 11 for those in schools not in the full-time programme.

Regarding the equipment of school spaces and materials, all the schools in the full-time programme have a library, but only nine from the 11 schools that are not part of the full-time programme have one. Also, six of the seven schools in the full-time programme have a cafeteria while only three of the 11 schools not in the full-time programme have one. Regarding the access to a computer laboratory, six out of seven schools in the full-time programme have access, but only three of the 11 schools not in the full-time programme have access. Additionally, full-time schools are located on average 68 kilometres away from the capital of the city, while non-full-time schools are located on average 72 kilometres away. In summary, the experience of the staff is similar in full-time and non-full-time schools, but the range of facilities is appreciably less limited in full-time schools.

In order to classify schools according to their remoteness, I decided to use the median of a rurality measurement as a cut point. Thus, schools that are 63 kilometres (or less) away

from the capital were categorized as *less rural*, while schools that were more than 63 kilometres away from the capital were identified as *rural*. As a result, 10 schools that are on average 48 kilometres away from the capital were classified as *less rural*, and eight schools that are on average 103 kilometres away from the capital were categorized as *rural*. In *rural* schools, the average number of students is 118, while in *less rural* schools the average is 151. Similarly, the average number of students in the 6th-grade classroom is 14 in the *rural* schools, and 20 in the *less rural* schools. Five out of the 10 schools categorized as *less rural* are part of the full-time programme, compared to two out of eight in *rural* schools.

Furthermore, the average years of experience for both principals and teachers is higher in *rural* schools than in *less rural* schools. In rural schools principals have on average 15 years of experience, compared with nine years of experience in *less rural* schools. Likewise, teachers have 18 years of experience on average in *rural* schools, compared to 15 years of experience in *less rural* schools. Finally, 60 per cent of the *less rural* schools have teachers with Licensure, compared to 50 per cent in *rural* schools.

Given the evidence summarized in this section, it is possible to argue that the schools in the sample are unrepresentative of the schools in the state of Hidalgo and even of the schools serving disadvantaged pupils. This is the consequence of the research decisions that were made during both the design phase and the fieldwork. First, schools are not representative at the state level because not all types of schools are included, not all marginality levels are included, and not all geographical areas are included. The implication of this is that the sample is biased to rural and general schools. Second, the sample is likely to not be focused on the most disadvantaged pupils as it is biased to high but not very high marginality areas, and also because it excludes indigenous and communitarian schools as well as schools located in unsafe and remote areas.

SECTION II – Data Collection

Once the schools were identified and characterized, the next step was gathering data that allowed me to answer the *first and second research question*. As mentioned before, the first research question enquires about the level of engagement of the students in the selected schools, while the second question enquires about the teacher practices and school characteristics that promote such engagement. In this section, I address the

selection of the instrument to collect quantitative data, the adaptation of the instrument to the Mexican context, and the administration of the instrument in the selected schools.

Selecting the instrument to answer research question one

I used three criteria to select the instrument to gather data on engagement. First, the instrument had to fit the descriptive nature of the research question; second, the instrument should be reliable and valid; and third, given that this research conceptualizes engagement as a metaconstruct with cognitive, behavioural and emotional domains, the instrument should be able to capture those domains, and share the definition in this research of each type of engagement.

A first option to gather data on student engagement was to conduct observations. However, observations were not considered an appropriate tool because although data on behavioural and emotional engagement could be gathered using this tool, cognitive engagement is not directly observable, as it deals with internal indicators such as ambition and satisfaction. Another tool considered was a teachers' rating scale on the engagement level of their students. This option was also dismissed, as it would be time consuming for the teachers who would need to report on every student. Furthermore, some authors argue that it is important to avoid having to make inference about behaviours from tools such as teachers' reports (Fredricks et al., 2004).

Given that the literature supports the idea that students in 6th grade are able to report on their cognitive, behavioural and emotional engagement (Blumenfeld & Meece, 1988; Fredricks et al., 2004), given the importance of understanding the students' perspectives, and considering that students had been exposed for eight months to their teachers, I decided to use a self-report method (applied to students) to collect data on engagement and teacher practices. In addition, by using a survey I was able to obtain comparable results across the selected schools (which fit the descriptive nature of the question), I could reach a larger sample (compared with other methods), I could identify more easily general trends from the data, and participants could spend more time reflecting on their responses.

Although I considered that a survey was the most appropriate instrument to gather quantitative data, it was important to be aware of its limitations. One potential problem when using a survey is that it only provides information about students' thoughts and

beliefs and not on the actual behaviour of the students. In fact, according to Robson (2011) the respondents will not necessarily report their beliefs and attitudes accurately as they can have a social desirability bias in the responses.[55] Moreover, data may also be affected by the characteristics of the respondent, such as memory and knowledge, and by numerous factors such as misunderstanding of questions or unclear format of response, which may not be detected by the researcher and which can bias the estimations and data analysis.

Considering that survey data are subject to measurement error from numerous sources (e.g. poor design of questionnaires), I decided to use an existing instrument. By using a well-developed instrument, it is possible to minimize the bias and therefore improve the quality of the responses. Prior use of a survey can identify problems such as ambiguity in the questions, wording of questions that influence the responses, misunderstanding of questions and therefore misreport, and content of preceding questions influencing respondents' interpretation of later questions. More practical problems such as not having allowed enough time for the participants to respond can also be identified in previous applications.

In addition, the use of an existing instrument ensures a rigorous specification of the concepts, an appropriate combination of the items that are part of the same construct, and the use of an adequate scale point. Moreover, it ensures that there are not lexical problems (i.e. the survey uses terms that most people interpret the same way), semantic problems (i.e. the respondent understands the question and is able to map the question in his/her situation), or pragmatic problems (i.e. the respondent is able to go beyond the literal meaning and infer what the researcher really intends him/her to understand).[56]

[55] An example of this type of bias could be a student providing an answer that makes him/her looks good in front of the teacher or the researcher.

[56] The use of an existing instrument also ensures the use of pretesting techniques to uncover context effects that could increase the errors in the test. These include *experts' reviews* of the questions (e.g. a questionnaire design expert or a subject matter expert); *cognitive interviews*, which are used to study the manner in which the target audience understands and responds to the material presented; *behavioural coding*, which refers to observations of the respondents' behaviour while answering the questionnaire; *focus groups* to learn how respondents structure their thoughts about a topic, their understanding of general concepts or specific terminology, or their opinions about the sensitivity or difficulty of the questions; *latent class analysis*, which is used to identify flawed survey questions; and finally *field tests* or *pilots*, which refers to the implementation of the data collection protocol in a smaller sample, to identify practical problems and ask respondents about their experiences while answering the questionnaire.

Having these considerations in mind and understanding that not all instruments that measure *student engagement* fit the theoretical framework of the research and that not all instruments are rigorously designed, I conducted a review of 22 instruments. The final list of instruments is the result of a literature review to identify instruments designed to measure *student engagement*.

The 22 instruments reviewed included four observational instruments that consisted of a coding system for observing individual students' on- and off-task, or to conduct observations across all students in the classroom. Three instruments were protocols for the teacher to report on student engagement in any subject or in the Reading class. The remaining 15 instruments were student self-reports, from which seven assessed the three dimensions of engagement, five assessed two dimensions, and three assessed one dimension.

Taking into account that observations and teachers' self-report were not considered appropriate instruments to gather data on engagement, and given the importance of using an instrument that included measures on the three types of engagement, only seven *student self-report* instruments were considered for further examination.

The seven instruments were: the Middle Grades Survey of Student Engagement (MGSSE); the Motivation and Engagement Scale (MES); the Student School Engagement Survey (SSES); the School Engagement Measure (SEM) – MacArthur; the 4-H School Engagement Scale (which is part of the longitudinal 4-H Study of Positive Youth Development); the Tripod Student Perception Survey; and the 2013 CPS My Voice, My School Survey (MVMS).

In general, the review of the instruments focused on two main aspects. First, considering the lack of consensus on the terminology and the variation in how engagement is defined and used across instruments, part of the analysis consisted of understanding if the instruments were in fact aligned with the methodological framework of the research. Second, it was crucial to determine if the surveys were reliable and valid (i.e. to what degree a student's measure remained consistent across repeated applications, and to what

extent the instrument actually measured the cognitive, behavioural and emotional engagement of the students).[57]

Having these considerations in mind, the 4-H School Engagement Scale was not considered a good fit for the research because the items on cognitive engagement did not include aspects such as the use of metacognitive strategies and academic mindsets, which are part of the definition in the research. Similarly, the SEM was discarded as the items included in the emotional engagement construct measured the students' affective reactions such as interest and boredom, that were not related to the definition in this research, which focuses on the students' sense of belongingness to the school.

Likewise, the theoretical framework of the MES was at odds with the theoretical framework in the research. In particular, the MES was designed to assess students at risk of academic failure, and therefore the behavioural engagement component measures the level of *disengagement* of the students. Furthermore, the emotional engagement of the students was measured using items that enquire about anxiety levels and self-sabotage, and not about their sense of belongingness to the school.

The MGSSE was dismissed because the items were worded to reflect general engagement at school level and not at classroom level. For instance, behavioural engagement was understood as student participation in school activities (such as extracurricular activities), while in the research it is defined as the investment and effort in learning and academic tasks. Similarly, the SSES was designed to evaluate interventions aimed at reducing truancy, and therefore the items on behavioural engagement are aimed to measure aspects such as skipping class and dropping out of school, and not student investment on academic endeavours. Finally, in spite of the fact that the theoretical framework of the Tripod Survey was very much in harmony with the definition of engagement in the research and that it was a reliable and valid instrument, it was not possible to agree with the developers on the cost of using the survey.

Since the constructs measured in the MVMS survey were also in line with the theoretical framework of the research and therefore could be used to estimate the cognitive,

[57] The method commonly used by the developers of the surveys to assess the reliability of the data is the internal consistency. This method provides a Cronbach's alpha coefficient that can take a value ranging from 0 to 1. A Cronbach's alpha of .70 or higher for a set of items is considered acceptable, as the closer the coefficient to 1, the more internally consistent the set of items is. The validity of the instrument is usually measured using correlation analysis, and exploratory or confirmatory factor analysis.

behavioural, and emotional engagement level of the students, and considering that the survey had a rigorous design process and was reliable and valid, the MVMS survey was selected for implementation. Other important factors that were taken into consideration were the fact that the majority of the questions were available in Spanish, and the fact that the survey was relevant for students in rural areas.

General characteristics of the MVMS survey

The survey was developed by the University of Chicago Consortium on School Research, and has been implemented since the early 1990s to all 6th–12th-grade students at the Chicago Public Schools. Data from the survey has been used to inform improvement efforts at the classroom, school and district level.

The MVMS survey comprises a questionnaire for students and a questionnaire for teachers. Both questionnaires are grounded on a framework developed by the Consortium to summarize five *essentials* or characteristics of good schools. These include: (i) effective leaders, (ii) collaborative teachers, (iii) involved families, (iv) supportive environment, and (v) ambitious instruction. According to research conducted by the Consortium, these essentials were found to be predictive of improvements in student gains. Specifically, they found that schools that were strong on three to five essentials were 10 times more likely to improve student learning gains in Mathematics and Reading, and 30 times less likely to stagnate than schools categorized as *weak* on three or more essentials.

The MVMS survey for teachers collects data on three of the five essentials: *effective leaders*, *collaborative teachers* and *involved families*. The MVMS survey for students, which is the one of interest for this research, captures data on student engagement and teacher practices. Data on teacher practices is captured under the essentials *supportive environment* (i.e. the school is safe, demanding and supportive) and *ambitious instruction* (i.e. delivering challenging and engaging classes).[58] Data on student engagement is not captured under any of the five essentials but by *supplemental constructs* (which include

[58] An in-depth analysis of the teacher practices' measures is provided later in this section, when the instruments to answer the second research question are discussed.

measures of behavioural and emotional engagement)[59] and by a construct that measures non-cognitive domains.

The *supplemental constructs* include measures of *grit*, defined as the degree to which a student stays focused on a long-term goal and entails working strenuously towards challenges, maintaining effort and interest despite obstacles; *academic engagement*, which is defined as the students' interest, attention and effort in learning; *rigorous study habits*, which measures the extent to which students take their studying seriously, for example by trying to do well even if the schoolwork is not interesting to them; *school connectedness*, which occurs when students feel included in their school's community; and *student classroom behaviour*, which examines how students treat each other and if they help each other learn.

The *non-cognitive construct* is a recent addition to the survey and was included due to the evidence on its importance for students' performance and persistence in education, among others. The non-cognitive construct includes items on three measures. The first measure is *academic perseverance*, which refers to the students' tendency to complete school assignments in a timely and thorough manner, giving their best despite distractions, obstacles, or level of challenge. The second measure is *academic mindsets*, which captures the psychosocial attitudes or beliefs that students have about themselves in relation to the academic work.[60] The third measure is *learning strategies*, which refers to the processes and tactics students employ in the cognitive development of thinking, remembering and learning (Farrington et al., 2012).[61]

Table 3.3 summarizes how the measures included in the MVMS survey are grouped, and how the constructs are related with the theoretical framework of this research.

[59] Although the supplemental constructs are considered by the developers as fundamental to improve student outcomes and used to be part of the core measures (i.e. the five essentials), they were recently removed to help the schools understand more easily the data coming from the survey.
[60] These include the students' belief that ability and competence grow with effort, the students' beliefs about their abilities to succeed at a given task, and the students' sense that the subject matter they are studying is interesting and holds value for them.
[61] These include strategies used by students to recall facts, to monitor their own comprehension, and to self-correct when they detect confusion or errors in their thinking.

Table 3.3. Parallel between measures in the MVMS survey and the theoretical framework of the research.

Essential/ construct in the MVMS survey	Student measure in MVMS survey	Corresponding measure in the research	Number of questions in the MVMS survey	Number of items in the MVMS survey
Ambitious instruction	ENGL – English instruction	Other	3	12
	MATH – Math instruction		4	12
	CLAR – Course clarity	Teacher practices	1	5
Supportive environment	PERC – Academic personalism	Teacher practices	1	5
	PRES – Academic press		3	7
	TRTS – Student–teacher trust		1	5
	ORDR – Discipline		1	3
	SAFE – Safety	Other	1	4
	ACNO – Peer support for academic work	Behavioural engagement	1	4
Supplemental constructs	GRIT	Behavioural engagement	1	4
	ENGG – Academic engagement		2	8
	STDY – Rigorous study habits		1	4
	PEER – Student classroom behaviour	Emotional engagement	1	4
	PSSM – School connectedness		1	5
	RIGR – Classroom rigour	Teacher practices	2	6
	PRS2 – Parent supportiveness	Other	1	5
	EMHL – Emotional health		1	4
	HUMR – Human and social resources in the community		1	5
	SCIE – Inquiry-based science instruction		1	5
	SSAF – School safety		1	3
Non-cognitive construct	Academic perseverance	Cognitive engagement	3	10
	Academic mindsets		7	24
	Learning strategies		6	24
Total	23		45	168

Note: The measures applied to students from 7th- to 12th-grades were not included in this table.
Data from Levenstein, 2016.
Source: Table developed by the author with information from University of Chicago Consortium on School Research.

As shown in the table, the MVMS survey has a total of 168 items distributed in 45 questions providing data on *ambitious instruction*, *supportive environment*, *supplemental constructs* and *non-cognitive constructs*. It is important to mention that the 16 questions included in the *non-cognitive construct* are not intended to be answered by each of the students. Instead they are distributed among six groups of students per classroom (from group A to F), so that each student only answers some of the questions.

Table 3.4. Reliability of student measures in the MVMS survey.

Essential/ construct	Student measure	Individual reliability	School level reliability
Ambitious instruction	ENGL – English instruction	0.78	0.843
	MATH – Math instruction	0.58	0.85
	CLAR – Course clarity	0.79	0.85
Supportive environment	PERC – Academic personalism	0.7	0.879
	PRES – Academic press	0.71	0.891
	TRTS – Student–teacher trust	0.65	0.924
	ORDR – Discipline	n/a	n/a
	SAFE – Safety	0.59	0.935
	ACNO – Peer support for academic work	0.74	0.871
Supplemental constructs	GRIT	0.72	0.841
	ENGG – Academic engagement	0.56	0.882
	STDY – Rigorous study habits	0.76	0.853
	PEER – Student classroom behaviour	0.46	0.934
	PSSM – School connectedness	0.79	0.899
	RIGR – Classroom rigour	0.83	0.887
	PRS2 – Parent supportiveness	0.79	0.777
	EMHL – Emotional health	0.76	0.858
	HUMR – Human and social resources in the community	0.68	0.925
	SCIE – Inquiry-based science instruction	0.83	0.944
	SSAF – School safety	0.82	0.944

Data from Levenstein, 2016.

The Consortium has developed the items over the past 20 years using focus groups, one to one interviews with students, teachers, and principals, and using quantitative pretests and psychometric analysis. Although the survey questions have proven to be reliable and to predict student and school outcomes, items are periodically examined using focus groups and questions wording experiments, to ensure the measures used every year are valid (Levenstein, 2016). Table 3.4 shows the individual and school reliability of the

student measures for 6th to 8th grades, which were determined using Rasch analysis (data on reliability was not available for the measures on the non-cognitive construct).

Although the MVMS survey was first developed for schools in Chicago, it is nowadays applied in school districts across the United States. According to the developers, the content is now universal for the United States because it excludes questions that were not relevant in less urban areas (as compared to Chicago) and includes items that were modified to be applicable in rural, suburban, and small-town settings (Levenstein, 2016). This is important because it means that the survey can be content-relevant for students in rural areas. Finally, the survey is applied using a paper-based format and is available in both English and Spanish; the items included in the non-cognitive construct are only available in English, though. The survey can be finished in less than 45 minutes.

Selecting the instrument to answer research question two

Once the instrument to answer the first research question was identified, the next step was selecting an instrument to gather data to answer the second research question. This research question enquires about the teachers' practices and school characteristics that promote student engagement, and is descriptive in nature. Therefore, I needed to determine if a student perception survey was also appropriate to gather data on teachers' practices, and if the items from the MVMS survey on teachers' practices could be used.

Although the research on the use of student perception surveys to evaluate teachers' practices has not been extensive, studies consistently suggest that students are competent judges of teaching and that student surveys are a reliable measure of teacher effectiveness. In fact, recent studies have shown that student surveys can accurately predict student achievement gains (Bill & Melinda Gates Foundation, 2012; Burniske and Meibaum, 2012). It can be argued that one advantage of using student surveys, to study teachers' practices, over observations is that they aggregate the impressions of many individuals who have spent many hours with the teacher, while observation protocols entail at most a handful of classroom visits.

Other techniques such as teachers' self-evaluation surveys and instructional logs were dismissed as methods to collect data on teacher practices, because they may be subject to social desirability and may generate results that are not comparable across schools. Although the analysis of classroom artefacts such as lesson plans, assignments, and

scoring rubrics can generate reliable data when using structured and valid protocols, its use was also discarded because they do not allow measuring aspects such as the student–teacher interaction, which is thought to promote student engagement.

Considering the limitation of these instruments, and given that student surveys have been shown to provide reliable and valid information on specific practices, can generate comparable results across schools (which was important given the descriptive nature of the research question), and would also be used to gather data on engagement, I decided to use them as a collection method to gather data on teacher practices.

In order to select the instrument to be used, I reviewed the items included in four surveys against the items used in the MVMS survey. The first instrument reviewed was the *iKnow My Class survey*,[62] which include measurement in the following constructs: meaningful engagement, relevant content for students, student–teacher relationships, students' sense of efficacy, students' perceptions of a cooperative learning environment, fostering of critical thinking, teachers' positive pedagogical practices, and students' perceptions of discipline problems.

The second instrument reviewed was *My Student Survey*, developed by Ryan Balch at Vanderbilt University. The survey measures six constructs including teacher–student relations, behaviour management, content expertise, engagement, coach (i.e. students' perception of the degree to which the teacher provides feedback and challenging tasks), and presentation (which relates to the teacher's ability to introduce new skills or ideas in class). After administering the survey to 15,000 students in the state of Georgia, the developer found the results from the survey to be reliable and predictive of student achievement and student engagement (Balch, 2012).

The third instrument reviewed was the *Tripod Survey*. As mentioned before, this survey measures seven constructs related to teacher practices. The constructs include *care*, *confer*, *captivate*, *clarify*, *consolidate*, *challenge*, and *control*.[63] The fourth instrument

[62] This was developed at the Quaglia Institute for Student Aspirations to provide feedback to teachers. Online administration is available and there is a version for students in grades six to 12. Bundick (2011) shows evidence of the reliability and validity of the instrument.

[63] *Care* evaluates concern for and commitment to students; *confer* refers to valuing students' points of view and promoting discussion; *captivate* evaluates inspiring curiosity and interest; *clarify* evaluates overcoming confusion and providing useful feedback; *consolidate* examines checking for understanding; *challenge* measures pressing for rigour and persistence; and *control* examines the ability to monitor student behaviours and foster classroom conditions that allow optimum learning.

reviewed was the survey *Youth Truth*, developed by the Center for Effective Philanthropy, which measures the seven constructs included in the Tripod Survey, plus the constructs *classroom rigour* and *teacher–student relationships* (Bill & Melinda Gates Foundation, 2012).

The last instrument reviewed was the *MVMS Survey*, which includes measures of six constructs: *instructional clarity*, *student–teacher trust*, *rigour*, *academic personalism*, *academic press*, and *orderly student behaviour or discipline*[64] (Allensworth et al., 2014).

Once I considered the limitations of having different wording of constructs and questions, I found four constructs in common across the five surveys: *student–teacher relationships*, *order (discipline)*, *rigour/challenge*, and *academic press*. The construct *captivate* is included in all surveys except in the MVMS survey, and the constructs *clarity* and *academic personalism* are only measured in the MVMS survey.

Given that the MVMS survey encompassed the constructs that were recurrent in the other surveys, and included other constructs that have been shown by the literature to be important for student engagement (e.g. clarity), and considering that no instrument will incorporate all constructs mentioned in the literature, I decided to use it in order to capture data on teacher practices.

Adaptation of the MVMS survey to the Mexican context

Although the MVMS survey was a robust instrument and was considered the best fit for the research, I was aware of the fact that no standard instrument would meet perfectly the needs of a different research project. For this reason, I adapted the survey for cultural sensitivity and reviewed the questions to ensure the final instrument was pertinent for the purpose of the research.

[64] In particular, *instructional clarity* measures the degree to which teachers provide clear learning goals and instruction that support achievement; *student–teacher trust* refers to the students' perceptions about the quality of their relationships with teachers (i.e. that their relationship is based on trust and open communication); *rigour* captures the degree to which teachers push students to be better thinkers, require them to explain their answers, and connect learning to life outside the classroom; *academic personalism* estimates how much teachers are aware of the students' academic needs and provide them with the support they need; *academic press* examines the degree to which the teacher expects everyone in the class to do well and also how often students feel challenged and feel they have to work hard to do well; orderly *student behaviour or discipline* evaluates the degree to which classrooms are controlled and students are doing what their teacher expects from them, for example going to class, participating, and getting their work done.

A first step to adapt the survey was to review all questions and items included in the original version. During the review, I noticed that some questions did not enquire about teachers' practices or student engagement, and that some of the questions were not relevant for Mexican students attending schools in rural areas. Before removing the questions, I considered that using a subscale or a set of items from a larger instrument or adapting scales by eliminating or changing items could threaten the validity of the survey.

For this reason, I consulted the developers of the instruments about the possibility of removing some questions from the original survey and about the implications of those changes. Although the developers agreed with the need to remove some of the questions, they strongly suggested removing entire questions and not just items, and only if strictly necessary to maintain the validity of the survey. Having these recommendations in mind, I conducted the following analysis of each construct.

The construct *ambitious instruction* included questions about *English instruction*, *Maths instruction* and *course clarity*. Given that the questions measuring English and Mathematics instructions were subject oriented I decided to remove them, as they did not contribute to the understanding of the teacher practices that promote engagement. To cite an instance one of the questions enquired about 'how often students discuss how culture, time, or place affects an author's writing'. All questions about *course clarity* were kept.

From the construct *supportive environment*, the questions related to *safety* were removed. Given that the schools were primary schools and children aged 10/11, some questions that are likely to be more appropriate to a secondary school setting were removed, specifically questions including the students' sense of safety 'in the hallways and bathrooms in the school' and 'crime and violence in the school'. Items on *school safety* were removed for the same reason.

From the *supplemental constructs*, I kept the questions on *grit*, *academic engagement*, *rigorous study habits*, *student classroom behaviour*, *school connectedness*, *importance of school for the future*, *class rigour*, and *parent supportiveness*.[65] The questions on *school*

[65] There were two questions enquiring about *class rigour*, one question with five items and another with one item. The question with one item was removed because it enquired about a topic already covered in the other question (i.e. teachers' encouragement to discuss different solutions or points of view).

safety, *emotional health*, *human and social resources in the community*, and *inquiry-based science instruction* were all dropped from the survey.

Although the questions on *emotional health* and *human and social resources in the community* might be indicative of the environment faced by the students (e.g. one of the items asked if people in the neighbourhood could be trusted), they were not related to the practices of the teachers or the level of engagement of the students. Similarly, the question about *inquiry-based science instruction* was not included because it was subject oriented and did not provide information to answer the research questions.

Even though all questions included in the *non-cognitive construct* were relevant for the students in the sample and were also aligned with the theoretical framework of the research, some of them were dropped because they measured the same construct. This is the case because, as mentioned before, these questions were not intended to be answered by all of the students, but instead they are distributed among six groups of students in each classroom (from group A to F), so each student only answers one question of each construct.

From the seven questions included on *academic mindset*, four were maintained (one on the students' beliefs about their abilities, and three about the students' sense of value to the subject they were studying). Additionally, from the six questions on *learning strategies* four were kept, and from the three questions on *academic perseverance* only one was kept.

The decision to not administer the entire instrument also responds to the need for brevity with very young students. Specifically, there was a concern about the burden that the proposed length (i.e. 168 items in 45 questions) would place on students.

Reducing the number of items to make the scale less burdensome made the scale more user-friendly and most importantly addressed the issue of the short attention span of very young children, which increased the probability of having more accurate answers and higher response rates. This was important as the field test illustrated that having a long survey could be potentially problematic during the implementation stage. In addition, there was also a time constraint that prevented a two-part survey over two different sessions, and there was also a need to minimize the impact of the survey on instructional time (which was already short in some of the schools).

Table 3.5 summarizes the process described above and clarifies which questions were removed (highlighted in grey), and which questions were part of the final instrument applied to answer research questions one and two.

Table 3.5. Summary of questions included and excluded from the MVMS survey.

Essential/ construct	Student measure	Corresponding measure	Number of questions in the original version	Number of questions in the final version
Ambitious instruction	ENGL – English instruction	Other	3	0
	MATH – Math instruction		4	0
	CLAR – Course clarity	Teacher practices	1	1
Supportive environment	PERC – Academic personalism	Teacher practices	1	1
	PRES – Academic press		3	3
	TRTS – Student–teacher trust		1	1
	ORDR – Discipline		1	1
	SAFE – Safety	Other	1	0
	ACNO – Peer support for academic work	Behavioural engagement	1	1
Supplement -al constructs	GRIT	Behavioural engagement	1	1
	ENGG – Academic engagement		2	2
	STDY – Rigorous study habits		1	1
	PEER – Student classroom behaviour	Emotional engagement	1	1
	PSSM – School connectedness		1	1
	RIGR – Classroom rigour	Teacher practices	2	1
	PRS2 – Parent supportiveness	Parental support	1	1
	EMHL – Emotional health	Other	1	0
	HUMR – Human and social resources in the community		1	0
	SCIE – Inquiry-based science instruction		1	0
	SSAF – School safety		1	0

Non-cognitive constructs	Academic perseverance		3	1
	Academic mindsets		7	4
	Learning strategies		6	4
Total			45	25

Note: The measures highlighted in grey were excluded from the survey.
Data from Levenstein, 2016.

A second step to adapt the survey was to translate the items in the non-cognitive construct into Spanish, the native language of the respondents. A total of nine questions (i.e. 34 items) were translated. Once all questions were in Spanish, an experienced teacher reviewed the questionnaire to ensure that the language of the questions was age appropriate, that the questions were clear and suitable for the academic level of a 6th-grader in Mexico, and that the survey was culturally sensitive.[66]

Before I applied the survey in the final sample of schools, I conducted a field test with a group of 6th-grade students in school HM7071. As a result of the pilot, I noticed that some students were confused by the answer box used in the format, and therefore were not able to report their answers properly. This was the case because although the developers provided the set of questions and introduction to be used, they did not provide the actual format they use in their application. To solve this problem, I developed a new format considering the problems I observed during the pilot.

During the pilot, I also noticed that the implementation of the survey took 15 minutes longer than planned. I also noticed that some of the students returned the survey without having answered all of the questions, or having answered the same question twice. Moreover, some students started answering the questionnaire without reading the introduction that was written at the beginning. None of the words or questions were identified as particularly problematic for the majority of the students (see Appendix 5 for the final version of the survey).

Survey administration

The survey was administered to a total of 315 students in the selected schools, between January and February 2015. I considered that conducting the survey in these months was convenient, as the students started the academic year in mid-August 2014. It implies that

[66] The only alteration suggested by the teacher was changing some words in the questions I translated. The questions, response options, the order of the questions, and the introduction to the survey were kept as in the original version in order to maintain the validity of the instrument.

by the time of the application they had been exposed to their teachers for at least six months. In all schools, the 6th-grade teacher had been the tutor for the entire academic year (see Appendix 6 for timetable).

Following a template, I provided students with information about the confidentiality of the answers, the importance of providing individual answers and the importance of double-checking before they turn in the questionnaire, among others. In addition, immediately after the students had returned the survey I checked that all questions were answered and gave the survey back to them if this was not the case. I also read aloud the introduction of the survey before its application, and provided an example of how to answer a question on the blackboard in order to show how to use the format and the logic of the questions (e.g. explaining the logic behind negatively worded items).

Although during the design phase I proposed to apply the survey at the end of the school day (to minimize the impact on instructional time), the decision about the best time to administer the survey was left to the teacher. In general, the survey was applied after the break and during a full class session (i.e. one hour). In some of the schools, the principal explained to the children the reason for the visit and in others the 6th-grade teacher made the introduction. Also, in all cases the survey was administered in the room where the students received instruction, and teachers decided if they wanted to stay in the classroom during the application or not. All students received a decorated pencil and sharpener that they could keep after the application.

The application of the survey was successful in all the schools. In most cases it was possible to conduct the survey in the scheduled day, and most of the 6th-graders attended the day of the application to the school. However, it is important to mention some difficulties faced during the application. As mentioned in the methodology chapter, in some schools the principal was not aware of my visit due to miscommunication between the school supervisor and him/her.[67] In order to solve this problem, I showed the principal the official letter from the SEP authorizing the visit and informing the supervisor of the school. All 18 principals agreed to participate in the study. In 16 schools, principals

[67] The school supervisors or inspectors are responsible for monitoring performance in a school zone, which on average consists of 14 schools, 100 teachers, and 2,000 students.

agreed to conduct the survey that same day, as planned, and in two schools I had to reschedule the visit.

Albeit I extensively explained the purpose of the research to the principal and teachers as well as my lack of affiliation with the SEP, in some cases the principal introduced me to the students as a staff member from the SEP. In order to avoid confusion, I explained once again in front of the students that this was not the case, and that I was a student in the United Kingdom, with no connection with the Mexican government.

There were some difficulties when implementing the survey in schools. In one of the schools there was a constant rumble caused by a factory next to it that could have distracted students (this happens every day, though). In other schools, the classroom was extremely dark due to lack of electricity. Discipline was also an issue when administrating the survey in few schools. As a case in point, after turning in the questionnaire, some students engaged in conversation distracting their classmates. When this was the case, I told students to leave the classroom or read a book once they had finished the survey. In school FD0907, some of the students may have rushed to finish the survey because their break had started, and in school BN2124 some of the students may have rushed to finish because the school day was over (in both schools, students took more than one hour to respond to the questionnaire).

SECTION III – Data Preparation

In this section, I discuss the characteristics of the data collected, making a distinction between school and individual-level data. In addition, I discuss how by conducting a Rasch model I was able to convert the raw data obtained from the survey into equal-interval data that allowed me to conduct the subsequent analysis using parametric statistics.

Characteristics of the data collected

As a result of implementing the survey, evidence containing individual level data on students' engagement and teachers' practices was obtained. In addition, I collected information on school characteristics *in situ*. As described before, a non-experimental design was implemented to collect the data. This implies that the survey was not applied as part of an experiment where students were randomly assigned to a treatment and a

control condition (making them comparable on all observed and unobserved variables). Instead, I collected observational data without any manipulation of the predictor variables to determine what factors were reported as important to promote engagement (i.e. what variables co-occurred).[68] In addition, it is important to remember that the sample is not representative, but instead purposive as described earlier.

Regarding the structure of the data, I constructed a cross-sectional dataset to conduct the analysis. It consists of a sample of 315 students (nested in 18 schools) and contains individual-level data on student engagement and teacher practices as well as school-level data on schools' characteristics. For the purpose of the analysis, it is assumed that the data was taken at a single point in time, although in practice students in different schools were surveyed during different days and within a limited period (two months). As a result, I was able to describe the level of engagement of the students in the sample, and other characteristics related to the teachers' practices, but was not able to conduct other kinds of analysis such as examining changes in the level of engagement across time.

School-level variables

During the fieldwork, I collected school-level variables and individual-level variables. The former correspond to characteristics of the 18 schools and were collected during the first visit to the schools. During the visit, the principal responded to questions regarding eight aspects of their schools, such as the total number of students in the school or whether or not the school was part of the full-time programme. The principal reported all the school-level variables, except by the measure of rurality (included as *remoteness*). Box 3.1 provides a description of the variables for which data was collected.

[68] The relevance of these aspects will be clear when the discussion on causality is introduced.

Box 3.1. Description of variables.

Individual-level/students (as reported by the students)
CE: score on cognitive engagement
BE: score on behavioural engagement
EE: score on emotional engagement
Parents: emotional and developmental support from parents
Gender: gender of the student. Dummy variable 1=male, 0=female

Individual-level/teachers (teachers' practices as reported by the students)

Trust: mutual trust and respect between students and teachers
Rigour: teacher encourages students to make connections and seek multiple perspectives through their coursework
AcPress (Academic Press): teacher expects students to do their best and to meet academic demands
Clarity: teacher provides clear learning goals and instruction that support achievement
AcPersonalism (Academic Personalism): teacher connects with students in the classroom and supports them in achieving academic goals
Discipline: teacher manages student behavior

Individual-level/teachers (as reported by the teacher)

ExpTch6: years of teaching experience of the 6th-grade teacher
QualifTch6: qualification of 6th-grade teacher. Dummy variable 1=Licensure, 0=Normalista
GenderTch6: gender of 6th-grade teacher. Dummy variable 1=male, 0=female

School-level

Number6: number of students in 6th grade
NumberSch: number of students in the school
Multi-grade: dummy variable 1=schools with one teacher per classroom, 0=schools where at least one teacher is responsible for teaching more than one grade level at a time
Fulltime: dummy variable 1=school is part of the full-time programme, 0=school is not part of the full-time programme
Library: dummy variable 1=school has a library, 0=school does not have a library
Computer lab: dummy variable 1=school has a computer lab, 0=school does not have a computer lab
Expprincipal (head teacher's experience): years as a head teacher in the school
Remoteness: kilometres from the school to the capital of the state (Pachuca)

The decision to collect data on the variables *school size* and *classroom size* was based on literature suggesting they facilitate at least one type of student engagement. The decision to include the remaining variables (i.e. being part of a full-time programme, being a school with complete organization, having a library, a computer laboratory, and the years

of experience of the principal) was derived through informal reasoning after considering that including these variables as possible promoters of student engagement was reasonable, based on common sense given that they have shown to be promoters of students' achievement.[69] Therefore, and due to the lack of literature, I considered it crucial to explore the correlation between these variables and student engagement.

Although the literature suggests a strong correlation between SES and student performance, data on SES was not collected given the difficulties of gathering it from children, and also considering the complexities of the measure, which is constituted by an interaction of different aspects of the families' daily life.

Regarding the difficulty of collecting this data from children, several authors have advised against obtaining measures of family income from adolescents, arguing that students' proxy reports of parental socioeconomic status can only be regarded as valid if the students are high school seniors, if they live with their parents, and if they are asked about characteristics that are meaningful to them (Mason, Hauser, Kerckhoff, Poss, & Manton, 1976; Looker, 1989; Entwisle & Astone, 1994; Hauser, 1994; Currie, Elton, Todd, & Platt, 1997).[70] The literature also advised against the use of students' survey reports to gather data on parental education (Kreuter, Eckman, Maaz, & Waterman, 2010).

In general, the concerns regarding collecting data on SES from young children are related to high non-response rates and measurement error. The latter is associated with the lack of knowledge of students regarding aspects such as household income or expenditure, lack of precision in their descriptions (e.g. job descriptions) and the tendency to give socially desirable responses (Schulz, 2005). Alternatively, I considered gathering data directly from parents, however this option was discarded as my visits to the schools (to apply the survey) took place during the mornings, when most parents were working.

Given the importance of including data on SES, I decided to include a proxy to examine its correlation to student engagement. Since free school meal status has been shown to be

[69] For instance, I expected that in schools with the full-time programme, one teacher per classroom, library, computer laboratory, and where the head teacher had more years of experience, the students would be more engaged (in at least one of the three types of engagement).
[70] In addition to the concerns about the reliability of the data, in the case of data on parental occupation it is important to consider that coding problems with open-ended responses could also be a source of bias.

a good proxy of socioeconomic status in other contexts, it was thought that it could be included as a proxy. However, I learned that because the schools in the sample were classified as marginal or highly marginal by the government, they all provide 'free school meals' to their students.[71]

Hence, I decided to use as a proxy of socioeconomic background a measure of rurality, under the assumption that students attending more remote schools would have lower socioeconomic status. Given that I did not collect data on rurality during the fieldwork, I had to explore different possible sources of data. Although there are no official figures on population density by locality, I used a tool developed by the Statistic Department called Mexican Digital Map to estimate them. However, the boundaries of the localities were not specified in the digital map and therefore the estimations of the areas occupied by each locality (and therefore the ones for population density) were not accurate.

Then, I considered that the proximity of the locality to the nearest main town could serve as a measure of rurality. Using a web mapping service, I located the centre of the locality and determined the distance in kilometres to the nearest *main town*. However, according to the field notes, there were *main towns* that were extremely isolated (and therefore the proximity of the locality to the main town was not a good indication of its remoteness). This resulted in remote localities appearing to be less rural than they actually were. Finally, the exercise was repeated but this time considering the distance from the centre of the locality to the capital of the state (Pachuca). This time, the measure was in line with the field notes regarding the isolation and poverty observed in the localities.[72]

Despite the efforts to accurately capture the rurality of the schools, rurality is not a measure of poverty and therefore using it as a proxy for socioeconomic status is limited. For instance, the variable *remoteness* could fail to capture the socioeconomic background of the students, if in fact students attending schools in remote areas are not poorer than their counterparts in less rural communities, because their parents have more stable jobs as farm workers in the rural areas (than parents living in less rural areas). This can also be the case if families, although living in remote areas, receive remittances which increase

[71] A free school meal in this context should not be understood as a free hot meal at lunchtime every day, as in most developed countries. Instead it should be understood as a small snack that is provided every day, usually consisting of a milk box and cookies.

[72] The statistics department collects extensive data to measure rurality; however, the data are limited to localities with more than 5,000 inhabitants. All localities in the sample (except by one) were under this threshold.

the financial resources available in the household. In addition, the measure does not distinguish between families with more or less educated parents.

Individual-level variables

The individual-level variables correspond to students' responses in the survey regarding their level of engagement and the practices of their teachers.[73] As mentioned before, there were nine questions enquiring about cognitive engagement, five questions about behavioural engagement, and two questions on emotional engagement. Concerning the practices of the teacher, the questionnaire included three questions on academic press, and one question for each of the remaining practices (i.e. teacher–student trust, rigour, discipline, academic personalism, and clarity). The questionnaire also included one question regarding the support from parents.

The survey used a 4-point rating scale, where students could *highly agree*, *agree*, *disagree* and *highly disagree* with the statements related to each type of engagement, and the practices of their teachers.[74] The data was then coded as '0' for responses where students highly disagree with the statement, '1' for disagree, '2' for agree, and '3' for highly agree. In the case of positively worded items the code with the highest number is the response the researcher wanted to observe.[75]

As a result, the raw (individual-level) data collected from the survey contains discrete (ordinal) data. This type of data provides information on the labels 3, 2, 1, 0 that indicates which rating scale categories were answered by the respondent (i.e. highly agree, agree, disagree, and highly disagree). Therefore, what is known with this type of data is that *highly agree* represents more agreement with the statement than *agree*, that *agree* represents more agreement with the statement than *disagree*, and so on. However, it is not possible from the data to determine the exact position of a response on a linear scale or even assume that the distance from one rating category to the next is equal (e.g. from *highly agree* to *agree*).

[73] From the individual-level variables, only the variable *gender* was not included in the questionnaire and instead was observed and reported by the researcher.
[74] Seven questions used a five-point rating scale. The response options for these questions were: *not like me at all*, *not much like me*, *somewhat like me*, *mostly like me*, and *very much like me*, and *none*, *a few*, *about half*, *most*, and *all*.
[75] Questions 1 (item one), 16, and 20 have reversed coded items.

The implication of having ordinal (non-equal interval) data is that it is not possible to compute parametric statistics. Therefore, in order to avoid incorrect statistical conclusions, a Rasch analysis was conducted to convert the ordinal data into equal-interval data. The result from the analysis was a dataset containing person measures (on each type of engagement and teachers' practices), which are values that express a student's response on a linear scale. Ignoring the fact that the raw data was ordinal might have led to the rejection of the null hypothesis when it was true.

Conducting Rasch analysis

The Rasch analysis model is an Item Response Theory model, used to score subjects on their abilities, attitudes and other latent traits. To illustrate how the Rasch model computes individual measures on those traits (e.g. engagement), equation 2 presents the Rasch model in its most simple form, which is the model for dichotomous data. The discussion that follows was developed in the context of a standard test situation where the students' skills are measured by the model using a standardized test (as opposed to the use of a survey to measure engagement level).

$B_n\text{-}D_i = 1n\ (P_{ni}/1\text{-}P_{ni})$

(*equation 2*)

where,

B_n represents the skill of person n, D_i represents the difficulty of item i, and P_{ni} represents the probability of person n correctly answering item i.

As shown in equation 2, by using Rasch analysis it is possible to model the probability of a correct response as a logistic function of the difference between the person (skill) and item (difficulty). The intuition behind the model is that there are enough responses for one person, for the model to be able to predict that person's skill;[76] and enough responses to an item (by numerous students), for the model to be able to determine how easy or hard it was to agree with an item.

Thus, the Rasch analysis reveals, for example, that the first item in a question is the most difficult to endorse and that the third one is the easiest. Given that the easier items generally get higher responses and the harder items generally get lower responses, it is

[76] In this research, the *person's skill* is equivalent to the person's level of engagement.

expected that students will respond more favourably to the third item than to the first item. Therefore, when the opposite (and extremely unlikely) pattern of responses is provided by a student, it is likely that it is due to some kind of error, such as the student not paying attention to the question. Because the scores of a student with extremely unusual response patterns are not very precise, they are given less weight when the school level scores are generated, compared to the relative weight given to scores of a student with a usual pattern of response (the same is true for a student with a large amount of missing data).

When the Rasch model is applied, the location of both person and items are estimated on a single linear scale. The item calibration is usually conducted first, again under the logic that the smaller the proportion of correct responses to an item, the higher the difficulty of the item and therefore the higher the item scale location (the mean items measure is set to 0.00 logits). As to the person location, the more strongly in agreement, the higher the person measure and the person scale location.

In the context of the survey, where the items were coded in such a way that a higher number meant *more engagement* (i.e. *strongly agree* was coded with '3' while *strongly disagree* with '0'), the correct interpretation of a student having a higher person measure is that this student is more engaged than a student with a lower person measure, because he or she was more strongly in agreement with the items than the other respondents. The comparison between respondents is possible given that persons and items are expressed in the same unit (logits) and this is an equal-interval unit.[77]

Furthermore, it is important to clarify that an extension of the Rasch model was used to describe the relationship between the student's *ability* and *performance* on the survey items. In particular, I first used a Generalized Partial Credit Model (GPCM) to conduct the analysis, however the results indicate that a more flexible model (in terms of the fit of the data to the model) should be used. For this reason, a Graded Response Model (GRM) was used to conduct the analysis. The GRM uses a two-parameter logistic model (2PLM) to compute boundary curves for each item, so each curve represents the

[77] When implementing the Rasch model a different measure must be computed for each individual for each trait (i.e. only items from a particular scale are combined). In the context of the research, this means that I computed a different measure for each of the 10 constructs included in the survey. Therefore, in order to compute an individual Rasch measure, for example on cognitive engagement, only the 34 items involving that trait were used, and a different set of items was used to compute a separate measure related to the emotional engagement of the students, and so on.

probability of a student's raw item falling above a given category *threshold* (e.g. *highly agree*). Contrarily, when the GPCM was used, the focus was on the relative difficulty of transitioning from one category of response to the next, for example moving from category 0 to 1 in an item, this considering that within an item, some transitions may be relatively easier/more difficult than others.[78]

As mentioned before, the purpose of using a Rasch model over simply averaging responses was to take into account the non-equal interval nature of the data. However, there are other important advantages of using the model. First, the model enables a relatively small number of questions to be asked and still generates a valid and reliable indicator. Second, it provides a standard error for each individual, which reveals how reliable the person's responses are; and finally, missing data can be handled easily (Levenstein, 2016).

The standard error is estimated based on the number of items that a person responded to and on the pattern of responses on those items. Students who respond to only a subset of items have a larger standard error than individuals who respond to all items in the measure. Given that the distribution of responses is known, students who respond in unexpected ways, for example at the extreme high or low end of the scale, also have large standard errors.

The problem of missing data is one of particular importance because it lowers the precision of the measures (under certain assumptions about the nature of that missingness); reduces the sensitivity of the fit statistics, and most importantly biases the measure estimates.[79] However, by using a Rasch model (where a single trait is measured and the data fits the model), it is possible to evaluate the responses of students who did not complete all items of the instrument. This is the case, because the students' measures are computed on the same (equal interval) scale that is used to express the performance of students who completed all items. For this reason, the fact that unanswered items are not included in the calculation does not affect the estimation of the person measure.

[78] In addition, the use of models such as GPCM and GRM is required when items in a survey are scored in more than two response categories like a Likert-scale, which is the case for the items on the survey.
[79] The problem of missing data not only affects the person measure computed for a respondent, but can also impact the relative difficulty measure computed for an item.

Although the model allows computing the individual measure even when there is missing data, it is important to understand why data might be missing. For instance, problems related to the items not being attempted by respondents can be related to poor time management, or lack of ability (e.g. respondents not reading fast enough or having reading comprehension problems). Missing data also results from respondents skipping items. This might occur if items are difficult to understand, if the questions are not pertinent for the respondents, or due to more practical reasons such as not having photocopied a survey's page. The latter can be problematic if the students not receiving the complete set of items are not randomly distributed.

In general, it is more likely that missing data resulted from students skipping some items or being unable to finish all the questions. This is because in all schools, teachers provided extra time to finish the survey where needed. Also, one day before applying the survey I made sure the questionnaires were complete (i.e. properly copied and assembled), and corroborated this because the data was complete when I coded it. In order reduce students skipping items due to lack of understanding or care, at the beginning of each application I wrote an example on the board to explain the logic behind the questions, and responded to all questions from students during the application. I also encouraged students to check that their questionnaires were complete before submitting them.

SECTION IV – Data Analysis: Answering Research Question One

As a result of conducting the Rasch model, I obtained person measures for every student (315 students in total), from 18 schools, for each of the constructs measured in the survey. As mentioned before, scores were computed for every type of engagement and every practice of the teachers. However, as the first research question only enquires about the engagement of the students, this section only discusses the results on engagement and excludes analysis regarding the practices of the teachers.

Before introducing the results, it is important to keep in mind that the objective of enquiring about the level of engagement of the students was to identify two classrooms with high levels of engagement where the case studies could be conducted. In order to provide sound evidence for the selection of the schools, this section focuses on providing full details of the 18 schools in terms of the engagement level of their students, and comparing the schools' results.

Table 3.6. Maximum and minimum person measures by type of engagement and school/classroom.

School ID	CE		BE		EE		All3		# of students in the classroom
	Max	Min	Max	Min	Max	Min	Max	Min	
CO8304	2.37434	-0.576906	1.05656	-1.11541	1.73975	-0.637166	1.39855	-0.681894	11
AI2440	2.00557	-0.769219	1.22944	-1.37567	1.47736	-0.637166	1.38495	-0.767594	23
PJ8974	2.07436	-1.11252	2.37974	-1.16549	1.73975	-1.2696	1.69326	-0.830104	20
US7450	1.19234	-1.3315	1.56154	-0.945761	1.73975	-1.07285	1.35739	-0.971474	11
BN2124	2.44263	-1.21131	1.87912	-0.460174	1.73975	-1.36916	1.77026	-0.622875	12
JM5574	1.49564	-0.975804	1.13841	-1.35746	1.73975	-1.09273	0.933172	-1.10806	12
FD0907	2.09273	-1.90758	2.22437	-1.76192	1.12017	-1.63804	1.55274	-0.957935	27
DC3398	1.21917	-2.1894	1.55902	-1.0049	1.35287	-1.05298	1.25528	-0.772117	13
EL7043	1.66405	-2.01891	1.6203	-2.21983	1.14286	-2.0792	1.09626	-1.64567	31
AN4053	2.0388	-2.17481	1.91306	-2.20664	0.889353	-1.47322	1.61374	-1.59872	15
GX2247	2.05227	-0.924918	1.52191	-1.37013	0.177464	-1.35686	0.995903	-0.99101	6
XC0947	2.38598	-2.40195	0.971562	-2.65434	1.47736	-2.05987	1.01363	-1.64052	38
TH7844	1.29692	-1.67575	0.767577	-2.14832	1.14434	-1.91478	0.916107	-1.81805	20
KJ9193	1.78607	-2.96901	1.61388	-2.37084	1.73975	-2.23938	1.71323	-1.9284	21
ZB1295	0.626208	-1.11957	1.627	-1.27814	0.287453	-0.942786	0.439958	-1.01057	10
HX3788	0.812877	-3.3134	1.11097	-4.99338	1.73975	-1.71964	1.12946	-2.45183	17
VQ4907	1.42587	-1.54907	0.574884	-1.65943	1.35287	-1.9463	0.903564	-1.55617	15
LR6576	1.07741	-2.78398	1.07883	-2.76263	1.73975	-1.76996	1.12602	-2.38636	13

Note: Data from the survey on student engagement.

Engagement level by school

A first approach to the data was to examine the person measures from the 315 students grouped by type of engagement and by school. For cognitive engagement, the student with the highest person measure in the sample has a score of 2.44, while the student with the lowest person measure has a score of -3.31. The results for behavioural engagement ranged from 2.37 to -4.99, and for emotional engagement from 1.73 to -2.23. When the overall score for the three types of engagement was computed, the person with the highest average measure has a score of 1.77, while the person with the lowest average measure has a score of -2.45. Table 3.6 summarizes the highest and lowest scores by school/classroom, by type of engagement. It is important to notice the limited number of students in some of the schools when examining the results.

To have a better understanding of the overall engagement level by school, Table 3.7 presents the score for each type of engagement by school as well as the average engagement level for the three types of engagement by school. For example, the average score of .70 for cognitive engagement in school CO8304 resulted from computing the scores on cognitive engagement from the 11 students in the classroom. The score .41 resulted from computing an average score from the scores of the school for cognitive, behavioural and emotional engagement (i.e. .70, .28 and .27 respectively).[80] It is important to be cautious when examining these results, as schools with different ranks on engagement may not be statistically different from one another (see further discussion in the subsection, 'The validity of the ranking on engagement').

In addition, Table 3.7 presents the position of each school in the academic test score ranking of value-added. This estimation corresponds to the position of each school in the ranking of value-added when all schools with positive value-added scores (296) were included (column 6).[81] To have a better understanding of the value-added of each school

[80] As can be inferred from the calculations, the same weight was given to each type of engagement, which indicates that I made a value judgement that the three types of engagement are valued equally.

[81] Although the selection of the final 18 schools was not based on their position in the ranking on value-added, it is thought this information helped to have a comprehensive view of the schools. Also, it is worth noting that some of the 18 schools do not rank very high. This may be the case because the sample of 296 observations includes schools with both low and high marginality levels, and the selected schools are only located in highly marginal areas.

in relation to the other 17 schools, column 7 presents a ranking when only the 18 schools in the sample were included in the estimation.

These results indicate that although the schools in the top of the ranking have in general high scores in all types of engagement, there are still differences in the three types of engagement within schools, that is, there are schools where students reported to be highly cognitively engaged but less emotionally engaged, or behaviourally engaged but less cognitively engaged, or where the opposite was true.

The validity of the ranking on engagement

As mentioned at the beginning of the chapter, the purpose of conducting these estimations was to identify the schools where the students reported to be more engaged, and select from those schools the ones that would be part of the case studies. In this order of ideas, the schools at the top of the ranking in Table 3.7 should be considered for the implementation of the case studies. However, before selecting the schools it was crucial to determine if the differences across schools (in terms of engagement) were in fact statistically significant. That is, to determine if the engagement levels of students in the sample were indeed different.

Table 3.7. Ranking of schools by type of engagement and value-added scores.

School ID	CE	BE	EE	Average/ranking on engagement	Value-added ranking (inc. 296 schools)	Value-added ranking (inc. 18 schools)
CO8304	0.707694395	0.281117483	0.270579718	0.419797199	138	11
AI2440	0.308380486	0.077741029	0.620452561	0.335524692	90	8
PJ8974	0.256242367	0.46066249	0.15479687	0.290567242	121	10
US7450	0.274270265	0.515143496	0.078239762	0.289217841	223	16
BN2124	0.210726945	0.323320683	0.204279359	0.246108996	44	3
JM5574	0.091901801	0.126667611	0.442722711	0.220430708	105	9
FD0907	0.114969918	0.246196924	0.152668803	0.171278549	283	18
DC3398	-0.029925272	0.290265843	0.006321448	0.08888734	39	1
EL7043	0.026783963	0.155908396	0.024494828	0.069062396	196	13
AN4053	0.114589636	-0.116470108	-0.219186455	-0.073688975	203	14
GX2247	0.254726366	0.009021662	-0.634804991	-0.123685654	173	12
XC0947	-0.09011675	-0.14967191	-0.193685141	-0.144491267	266	17
TH7844	-0.100401852	-0.239608645	-0.32156887	-0.220526456	77	7
KJ9193	-0.373253386	-0.244076407	-0.181875075	-0.266401623	49	4
ZB1295	-0.343774171	-0.220202505	-0.386596808	-0.316857828	57	5
HX3788	-0.577692374	-0.602533143	0.080255714	-0.366656601	41	2
VQ4907	-0.180306255	-0.419816034	-0.534035017	-0.378052435	221	15
LR6576	-0.624174473	-0.372764956	-0.521040498	-0.505993309	62	6

CE Mean:0.0022579 - SD:0.3355377; BE Mean:0.0067168 - SD: 0.3191317; EE Mean: -0.0532212 - SD: 0.346117.
Source: Developed by the author using data from survey on engagement.

To make these comparisons between schools, I estimated individual school residuals (U_{0j}) after having fitted a multi-level (random effects) model. Although full details about the use of a random effects model and the importance of residuals will be examined in Chapter 4 (see equation 6 and the subsequent discussion), it is relevant to present at this stage the findings from the comparisons between schools.

To determine if the differences across schools were statistically significant, I estimated the apparent effect of each school on the engagement level of its students. In a random effects model, the school effects are captured by the term U_{0j}. Specifically, the model allows the mean of each school to depart (i.e. to be raised or lowered) randomly from the overall mean (β_0) by an amount U_{0j}. These departures from the overall mean are known as level two residuals and are assumed to be normally distributed, independent of any other predictor variable included in the model, and have an estimated variance of 0.169.

Although the true values of the level two residuals are unknown, they can still be predicted given the observed data and the estimated parameters in the model. In general, the residuals can be estimated by subtracting individual predictions from observed values. In particular, the level two residuals were estimated considering equation 6, where the dependent variable is the cognitive engagement (CE) of student i in school j (CE_{ij}). In order to predict the residuals, the raw residual of student i (r_{ij}) is estimated subtracting the observed value (CE_{ij}), from the predicted value from the regression ($\widehat{CE}_{ij}$). Then, the raw residual for school j (r_{+j}) is computed as the mean of the r_{ij} for the students in the school. Once the raw residual for the school j (r_{+j}) is estimated, it is multiplied by a factor known as the intra-class correlation[82] as shown in equation 3.

$$u_{0j} = \frac{\sigma_{u0}^2}{\sigma_{u0}^2 + \sigma_e^2/n_j} + r_{+j}$$

(*equation 3*)

where,

n_j is the number of students in school j, σ_{u0}^2 is the variance between groups, and σ_e^2 is the variance between pupils within schools. Using the procedure described above, the school effects and associated standard error were estimated for each school, for each type of

[82] The intra class correlation or variance partition coefficient is the proportion of the total residual variation that is due to differences between schools.

engagement. Figures 3.1, 3.2 and 3.3 (one for each type of engagement) plot these effects in ascending order with 95 per cent confidence intervals computed using 1.96 times the estimated standard errors, so it is possible to make comparisons between each school and the average school.

In each of the figures there are 18 level 2 residuals plotted, one for each school in the dataset. Looking at the figures, it is possible to see that the confidence intervals of the school residuals overlap each other in most cases, and therefore it is possible to argue *they are not significantly different from one another*. Given that these residuals represent school departures from the overall average predicted by the parameter B_0, it is not possible to argue for example that students in the schools at the top of the ranking are in fact more engaged than students in many other schools.

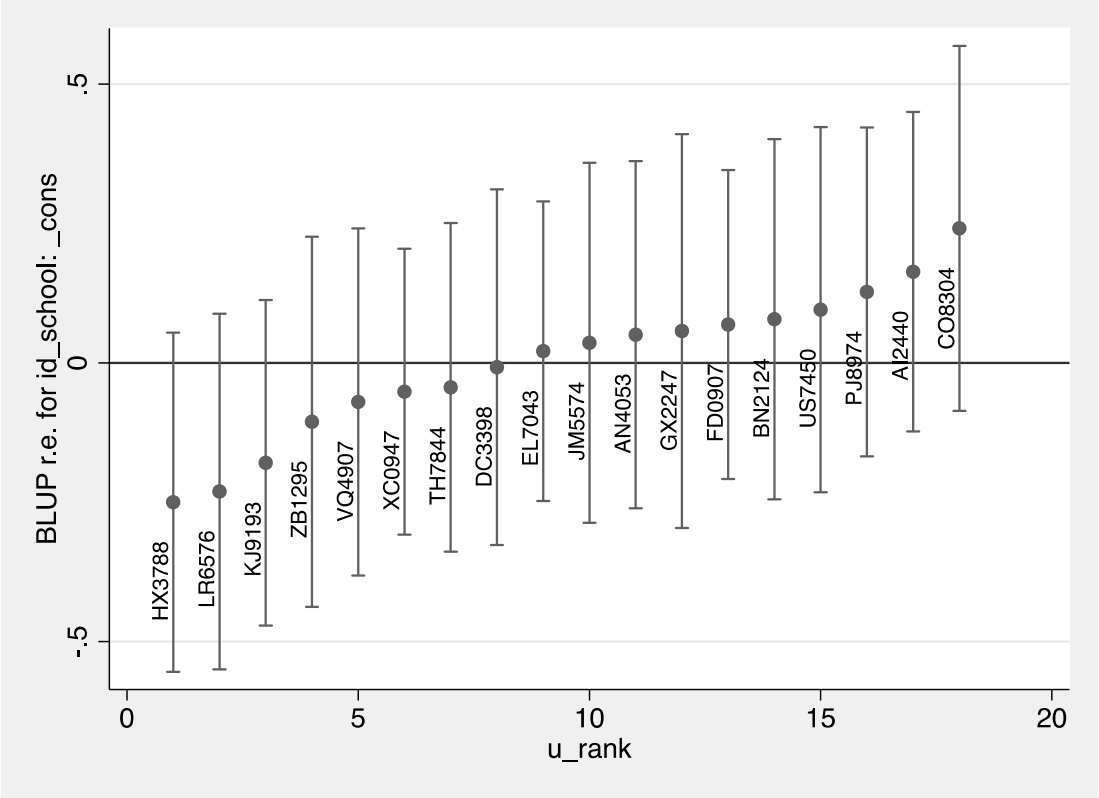

Figure 3.1. School effects on cognitive engagement for the 18 schools with 95% confidence intervals.

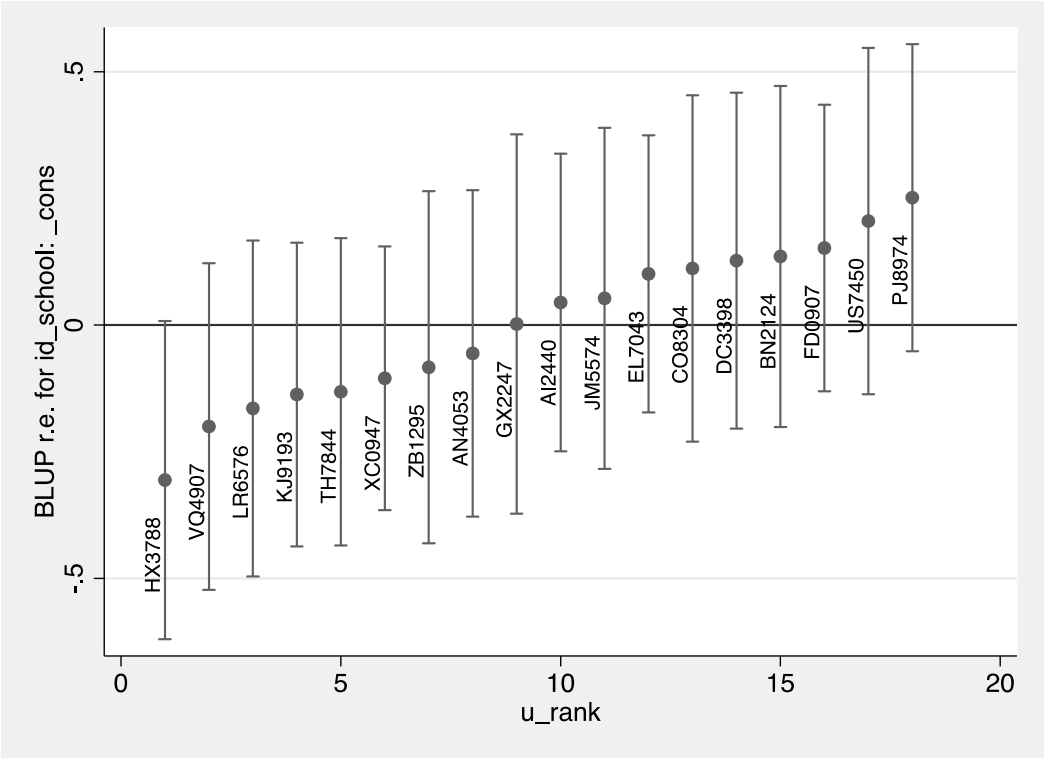

Figure 3.2. School effects on behavioural engagement for the 18 schools with 95% confidence intervals.

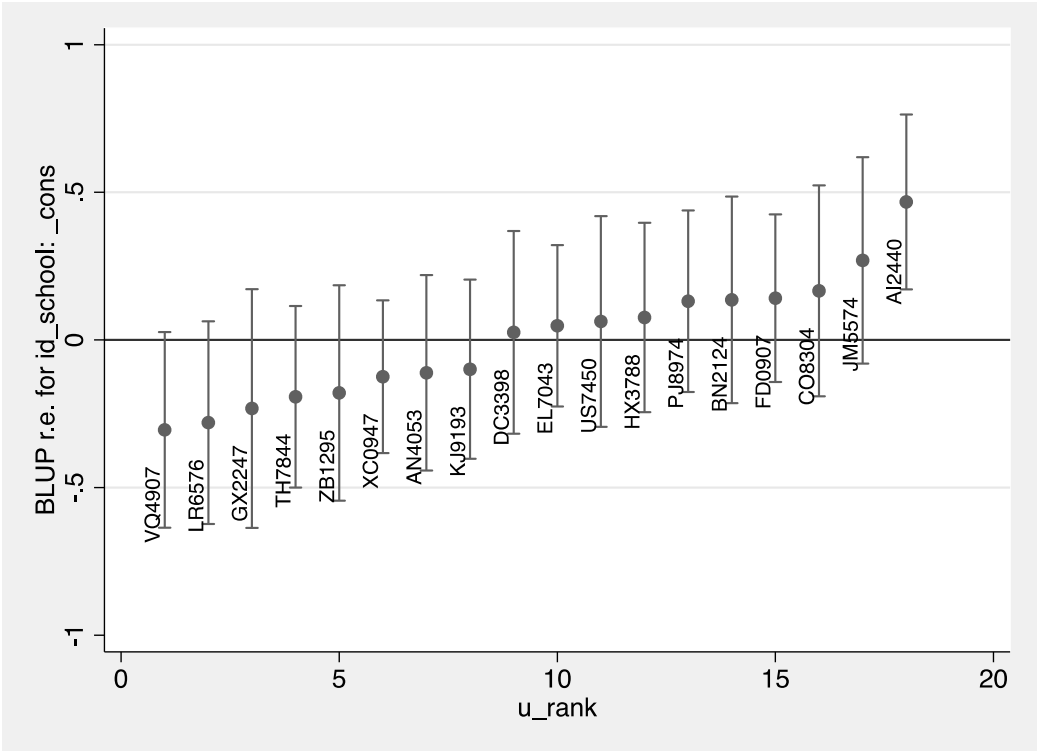

Figure 3.3. School effects on emotional engagement for the 18 schools with 95% confidence intervals.

Selecting schools for the case studies

Given the results showing that in fact all schools are similar in terms of engagement, it was not possible to select schools for the case studies based on evidence showing that students in some of the schools were significantly more engaged than in others. Acknowledging this fact, and considering that although not statistically different, the results on engagement were marginally better in some schools, I decided to select the schools with relative high scores in terms of cognitive, behavioural, and/or emotional engagement, as presented in Table 3.7. In addition to these criteria, safety and access to remote areas were also considered in the selection process.

Considering the results from the 18 schools in each type of engagement, I concluded that schools CO8304 and AI2440 should be invited to participate in the case study so an in-depth analysis of the practices of their 6th-grade teachers could be conducted. School CO8304 was selected since it had a relative high score on cognitive engagement (0.7) and also relative high scores on emotional engagement and behavioural engagement. Similarly, school AI2440 was selected given that it had a relative high score on emotional engagement (0.62) and on cognitive engagement.[83]

As mentioned in the methodology chapter, initially a more comparative research design was proposed, where classrooms with high and low engagement were compared in terms of the teachers' practices. Although this was considered a more robust design, it was later discarded given the foreseeable difficulties of gaining access to schools where students reported being disengaged.

Exploring the correlations between types of engagement

Once the level of engagement of the students in each school was established and the schools for the multiple case study were selected, it was then important to have a second

[83] Although school US7450 had a relative high score on behavioural and cognitive engagement, it was not possible to select it for the case study due to safety reasons. Specifically, when I conducted the survey, I learned that the road to access the community 'Dos Caminos' where the school was located was indeed a very dangerous one. The community was located 880 metres above sea level, and at some points the road to access the locality reached an altitude of 1,500 metres above sea level. Therefore, the three-hour trip from the closest main city (Tulancingo) to the school, was characterized by roads bordering mountains, where fog caused poor visibility. Alternatively, personnel from the SEP offered help to find a house in the community so I could live there while conducting the research in the school. This option was not considered because I did not think it was safe to spend the nights in the community in such an isolated location, where mobile phone signal was not available.

approach to the data by analysing the correlations between the three types of engagement in each of the schools. Before introducing the results from the correlations and subsequent analysis, the theory behind the use of correlations will be briefly introduced.

Correlations explore the relationship between variables. Therefore, the aim of conducting a correlation is to determine if the variables are positively related, negatively related or related at all. An example of a positive relationship using data on engagement is one in which the more cognitively engaged a student is, the more behaviourally engaged she or he is. Contrarily, an example of a negative relationship is one in which the more cognitively engaged a student is, the less emotionally engaged she or he is. Finally, an example of the variables not being related at all is one in which, as the cognitive engagement of a student gets higher, his or her behavioural engagement remains the same.

When a correlation coefficient is computed, the model tests the null hypothesis that there is no linear correlation between the variables. In the case that the p-values resulting from the correlation are less than 0.05, the null hypothesis is rejected and it can be concluded that the correlation coefficients are statistically significant. A probability value of 0.05 indicates that the probability of these correlations occurring by chance is less than five times out of 100. However, it is important to notice that although positive (or negative) and significant, correlation coefficients give no indication of causality because there may be other unmeasured variables affecting the results.

Results from the correlations

Table 3.8 presents the correlation coefficients for the three types of engagement when data from all schools in the sample was included. Given that the p-values for all the estimations were less than 0.001, the null hypothesis was rejected and it could be concluded that there is a statistically significant relationship between the variables. The results also show that the deviations are being made in the same direction (e.g. as students increase their cognitive engagement they also increase their behavioural engagement).

Table 3.8. Correlation coefficients including data on 18 schools.

CE all schools	CE all schools	BE all schools	EE all schools
CE all schools	1.0000		
BE all schools	0.7391* 0.0000	1.000	
EE all schools	0.3436* 0.0000	0.4274* 0.0000	1.0000

According to these results, there is a strong and significant positive relationship between behavioural engagement and cognitive engagement (r=0.73; p-value p<.05). As will be evident in the results below, the strong and significant relationship between cognitive and behavioural engagement is a constant across schools. In addition, the results indicate that there is a strong and significant relationship (although smaller than the one between cognitive and behavioural engagement) between cognitive engagement and emotional engagement (r=0.34) and between behavioural and emotional engagement (r=0.42).

Table 3.9 examines the direction and strength of the relationship between variables, but this time it presents the correlation coefficients by school. Table 3.9 indicates the identification number for the 18 schools, the number of students who responded to the questionnaire in each 6th-grade classroom, the correlation coefficients and corresponding p-values.

Table 3.9. Correlation coefficients for cognitive, behavioural and emotional engagement by school.

School ID	Sample size	Type of engagement	CE regression coefficient/p-value	BE regression coefficient/p-value
CO8304	11	**BE**	0.8091* 0.0026	
		EE	0.5051 0.1130	0.4397 0.1760
AI2440	23	**BE**	0.5280* 0.0096	
		EE	0.4107 0.0516	0.3523 0.0992
PJ8974	20	**BE**	0.5386* 0.0143	
		EE	0.4385 0.0531	0.5219* 0.0183
US7450	11	**BE**	0.6959*	

			0.0174	
		EE	0.4376 0.1783	0.4240 0.1938
BN2124	12	**BE**	0.4739 0.1196	
		EE	0.3739 0.2312	0.5374 0.0716
JM5574	12	**BE**	0.7525* 0.0047	
		EE	0.0291 0.9284	0.4598 0.1326
FD0907	27	**BE**	0.8465* 0.0000	
		EE	0.3403 0.0824	0.2333 0.2416
DC3398	13	**BE**	0.1454 0.6355	
		EE	0.0658 0.8309	0.6779* 0.0109
EL7043	31	**BE**	0.8359* 0.0000	
		EE	0.2815 0.1249	0.4051* 0.0238
AN4053	15	**BE**	0.8846* 0.0000	
		EE	0.4955 0.0603	0.7639* 0.0009
GX2247	6	**BE**	0.8927* 0.0167	
		EE	0.164 0.7562	-0.0021 0.9968
XC0947	38	**BE**	0.7559* 0.0000	
		EE	0.2615 0.1128	0.4019* 0.0124
TH7844	20	**BE**	0.7913* 0.0000	
		EE	0.5288* 0.0165	0.6292* 0.0030
KJ9193	21	**BE**	0.9148* 0.0000	
		EE	0.4162 0.0606	0.5541* 0.0092
ZB1295	10	**BE**	0.7545* 0.0117	

		EE	-0.5414 0.1060	-0.2671 0.4557
HX3788	17	**BE**	0.7494* 0.0005	
		EE	-0.1945 0.4545	-0.1039 0.6916
VQ4907	15	**BE**	0.7375* 0.0017	
		EE	0.6477* 0.0090	0.6322* 0.0114
LR6576	13	**BE**	0.7741* 0.0019	
		EE	0.3176 0.2903	0.7036* 0.0073

Note: * denotes p-value p<.05.

According to the results, the relationship between cognitive and behavioural engagement appears to be not only significant and positive but also strong in all schools in the sample (except in two schools where the results are not statistically significant). The results also suggest that although the correlation between cognitive and emotional engagement is positive in 16 schools, the p-values are only statistically significant in two of the 18 schools. However, it is important to notice that in six schools the results are nearly significant with p-values between 0.06 and 0.08. Regarding the relationship between behavioural and emotional engagement, the results indicate that the relationship is positive and statistically significant in nine of the 18 schools.

In the schools selected to participate in the case study the relationship between cognitive and behavioural engagement is strong, positive and statistically significant. Contrarily, the relationships between emotional and behavioural engagement, and between cognitive and emotional engagement are not statistically significant (although they are nearly significant in school AI2440). However, it is important to consider that the relatively small sample sizes of the schools/classrooms may partially explain the lack of statistical significance of some of the results. This may be the case because in small samples the confidence intervals are broader and therefore the estimations are less precise.

Although these results suggest the importance of examining the correlations between cognitive and behavioural engagement in the subsequent analysis of qualitative data, and provide a first approach to examine the practices of the teachers in relation to these two types of engagement, it is crucial to keep in mind during the qualitative analysis that the

correlation between cognitive and emotional engagement and behavioural and emotional engagement may still be significant.

CONCLUSION

The aim of conducting the analysis presented in this chapter was to determine the engagement level of the students in the sample. This, to investigate if the students in the selected schools, which outperformed on the national standardised test, perform at a high level due to the teachers' ability to engage them.

The results revealed that even though in some schools the students reported to be engaged, the relationship between the position of the school in the value-added ranking and the engagement level of the students was not linear. That is, in this sample it is not always the case that the schools with higher value-added scores have at the same time the most engaged students. This finding is in line with the literature suggesting that although engagement influences the students' ability to perform at a high level, there are several other determinants of school success.

Although the analysis also revealed that the differences across schools (in terms of engagement) were not statistically significant, the results indicate that student engagement was marginally better in some schools. These schools tend to engage students behaviourally, cognitively and emotionally, as opposed to engaged them only in one type of engagement. In addition, they prioritise one type of engagement as shown by the higher scores in one of the engagement types relative to the other two. Even in these engaging schools some of the students reported to be disengaged, although to a lesser extent that in the less engaging schools.

Finally, the results in this chapter revealed the importance of examining in the subsequent qualitative data analysis the strong correlation between cognitive and behavioural engagement, and the need to explore further the correlations between cognitive and emotional engagement and behavioural and emotional engagement, which are non significant in this analysis.

CHAPTER 4: PROMOTERS OF STUDENT ENGAGEMENT AS REPORTED IN THE STUDENT SURVEY

This chapter addresses the *second research question*, which enquires about the teachers' practices and school characteristics that promote student engagement in the 18 selected classrooms. The purpose of this question is to examine the relationship between student engagement and a set of individual and school-level variables.

As explained in the previous chapter, the variables for which data was collected can be divided into school-level variables and individual-level variables. The school-level variables correspond to the characteristics of the 18 schools, and the individual-level variables correspond to the responses of the 315 students regarding their level of engagement and the practices of their teachers. Contrary to the answer to research question one, where only individual-level data on engagement was used, answering research question two required the analysis of school-level data, and individual-level data from students on teachers' practices (as well as on engagement).

In the interest of investigating the relationship between engagement and this set of variables, regression analysis was conducted. Given that the statistical processes play a central role in the analysis of the data, the theory behind the models used is presented in tandem with the results. The first section of this chapter introduces the results from a simple regression model, while the second section discusses the findings from implementing a multi-level model using random effects. The chapter ends with a discussion on how the findings in this chapter informed the qualitative phase.

SECTION I – Simple Regression Model

In order to have a first approach to the data, a simple regression model was conducted to examine the correlation between *gender* and the cognitive, behavioural and emotional engagement of the students. The results are presented in Tables 4.1, 4.2 and 4.3.

Although it is not possible to claim causality from the results in Table 4.1, the R-squared provides a first approximation to the data, by indicating the amount of variability in the variable *cognitive engagement* that is shared with the variable *gender*. The reported R-squared for this regression is .11, which indicates that the variable *gender* accounts for 11 per cent of the variation in *cognitive engagement*. This implies that 89 per cent of the

variability in cognitive engagement still needs to be explained by other variables. Another measure of the overall model fit is the F-ratio. Given that the F-ratio is 2.17 (>1), it can be inferred that the improvement in prediction due to the model is larger than the difference between the model and the observed data.

Table 4.1. Regression: cognitive engagement on gender.

Number of obs = 315
F(18, 296) = 2.17
Prob > F = 0.0043
R-squared = 0.1169
Root MSE = .93206

ce	Coef.	Std. err.	t	P>|t|	[95% conf. interval]	
Gender	-0.1512306	0.0541171	-2.79	0.006	-0.2577336	-0.0447276
VQ4907	0.3145866	0.2812996	1.12	0.264	-0.239014	0.8681872
AI2440	**0.77962**	**0.223248**	**3.49**	**0.001**	**0.3402656**	**1.218974**
ZB1295	(omitted)					
EL7043	0.4865786	0.2238199	2.17	0.030	0.0460986	0.9270585
LR6576	-0.1943776	0.4379458	-0.44	0.657	-1.05626	0.6675044
AN4053	0.5893338	0.327398	1.8	0.073	-0.0549889	1.233656
CO8304	**1.131149**	**0.346213**	**3.27**	**0.001**	**0.4497982**	**1.8125**
TH7844	0.3793794	0.2523363	1.5	0.134	-0.1172211	0.8759799
DC3398	0.4696176	0.2990717	1.57	0.117	-0.1189587	1.058194
FD0907	0.5404605	0.2646008	2.04	0.042	0.0197233	1.061198
BN2124	0.7005829	0.3553884	1.97	0.050	0.0011747	1.399991
KJ9193	0.1417896	0.2885385	0.49	0.624	-0.4260572	0.7096365
PJ8974	0.7058003	0.2432288	2.9	0.004	0.2271234	1.184477
HX3788	-0.1752483	0.2711027	-0.65	0.519	-0.7087812	0.3582847
JM5574	0.5313849	0.2997578	1.77	0.077	-0.0585417	1.121312
GX2247	0.7193958	0.3964926	1.81	0.071	-0.0609059	1.499698
US7450	0.7252014	0.2817056	2.57	0.011	0.1708017	1.279601
XC0947	0.3825064	0.2315722	1.65	0.100	-0.0732302	0.8382431
_cons	-0.4584328	0.170349	-2.69	0.008	-0.7936815	-0.1231842

Note: Outcome from stata after conducting the regression, ce gender schid*, robust (where *schid* refers to the school ID, and *ce* refers to cognitive engagement).

Given that the correlation coefficient (β_1) indicates the change in *cognitive engagement* due to a unit change in *gender*, and considering that the variable gender was coded 0/1 (0=female, 1=male), the result -.15 should be interpreted as males having .15 units less of cognitive engagement than females. This is the case, as a unit change in the predictor

(*gender*) is the change from 0 (female) to 1 (male), and therefore β_1 represents the difference in the change in *cognitive engagement* if the person is male or female.

Furthermore, the t-statistic is significant as the p-value reported is .006. Given that the p-value is less than 0.05, the null hypothesis that the difference between group means is 0 is rejected, and it can be concluded that the group coded with 1 (male) is significantly different from the group coded with 0 (female) in terms of cognitive engagement. A probability value of 0.05 indicates that the probability of this result occurring by chance is less than five times out of 100.

Additionally, the results report the regression coefficients for the selected schools.[84] Similarly to the analysis presented above, given that school AI2440 was coded 1/0 (i.e. 1 for school AI2440, and 0 for the other 17 schools), it can be inferred that students in school AI2440 are .77 units more cognitively engaged than students in the other schools. Similarly, the regression coefficient for school CO8304 is 1.13, which indicates that students in this school are 1.13 units more cognitively engaged than students in the other 17 schools. The coefficients of both schools are the highest in the sample for this type of engagement.

The same regression described above was conducted but this time to predict the behavioural engagement of the students based on their gender and the school they attend. Table 4.2 displays the results from the regression.

The R-squared reported suggests that the variable *gender* accounts for 15 per cent of the variation in behavioural engagement. This implies that 85 per cent of the variability in behavioural engagement still needs to be explained by other variables. In addition, the results report a regression coefficient for the variable *gender* of -.21 and a p-value of 0.000. Similarly to the findings on cognitive engagement, these results indicate that males have .21 units less of behavioural engagement than females.

Although the regression coefficients by school are positive for the schools selected for the case studies, they are not statistically significant. Therefore, it cannot be suggested that students in these schools are more behaviourally engaged than students in the rest of

[84] The schools selected to conduct the case studies (i.e. schools AI2440 and CO8304) are highlighted in bold in Tables, 4.1, 4.2 and 4.3.

the schools. In fact, only four of the 18 schools have results that are statistically significant.

Table 4.2. Regression: behavioural engagement on gender.

Number of obs = 315
F(18, 296) = 3.25
Prob > F = 0.0000
R-squared = 0.1548
Root MSE = .87683

be	Coef.	Std. err.	t	P>|t|	[95% conf. interval]	
Gender	-0.2171883	0.0518014	-4.19	0.000	-0.3191341	-0.1152425
VQ4907	0.0174145	0.3241408	0.05	0.957	-0.6204981	0.655327
AI2440	**0.4810024**	**0.3006812**	**1.6**	**0.111**	**-0.1107413**	**1.072746**
ZB1295	(omitted)					
EL7043	0.5427331	0.3079513	1.76	0.079	-0.0633185	1.148785
LR6576	-0.0290235	0.4209982	-0.07	0.945	-0.8575526	0.7995055
AN4053	0.2918239	0.3928584	0.74	0.458	-0.4813257	1.064974
CO8304	**0.6157534**	**0.3447664**	**1.79**	**0.075**	**-0.0627505**	**1.294257**
TH7844	0.1759193	0.3240085	0.54	0.588	-0.4617329	0.8135715
DC3398	0.7341748	0.3701385	1.98	0.048	0.0057382	1.462611
FD0907	0.5837556	0.3285715	1.78	0.077	-0.0628766	1.230388
BN2124	0.753317	0.3472228	2.17	0.031	0.0699788	1.436655
KJ9193	0.222091	0.3483757	0.64	0.524	-0.463516	0.9076981
PJ8974	0.8327849	0.3299078	2.52	0.012	0.1835229	1.482047
HX3788	-0.2980723	0.4117809	-0.72	0.47	-1.108461	0.5123169
JM5574	0.4843217	0.3620952	1.34	0.182	-0.2282855	1.196929
GX2247	0.4028462	0.4180167	0.96	0.336	-0.4198151	1.225508
US7450	0.8892395	0.3310468	2.69	0.008	0.2377358	1.540743
XC0947	0.2555759	0.3073499	0.83	0.406	-0.3492921	0.8604439
_cons	-0.3848686	0.2729799	-1.41	0.16	-0.922096	0.1523587

Note: Outcome from stata after conducting the regression, be gender schid*, robust (where *schid* refers to the school ID, and *be* refers to behavioural engagement).

Finally, a regression was conducted to predict emotional engagement based on the gender of the students and the school they attend. The results are presented in Table 4.3.

According to the results, the variable *gender* accounts for 13 per cent of the variation in emotional engagement (these results are similar to the ones reported for cognitive and behavioural engagement, 11 and 15 per cent respectively). However, contrary to the estimations for cognitive and behavioural engagement, this time the t-statistic of the

regression coefficient is not statistically significant. Given that the p-value is greater than 0.05, the null hypothesis cannot be rejected, and it can be concluded that the emotional engagement of the group coded with 1 (male) is not significantly different from the emotional engagement of the group coded with 0 (female).

Table 4.3. Regression: emotional engagement on gender.

Number of obs = 315
F(18, 296) = 4.02
Prob > F = 0.0000
R-squared = 0.1386
Root MSE = .80078

ee	Coef.	Std. err.	t	P>|t|	[95% conf. interval]	
Gender	-0.0313558	0.0464828	-0.67	0.500	-0.1228344	0.0601229
VQ4907	-0.1161052	0.3085902	-0.38	0.707	-0.7234141	0.4912037
AI2440	**1.033477**	**0.1822428**	**5.67**	**0.000**	**0.6748215**	**1.392133**
ZB1295	(omitted)					
EL7043	0.4351475	0.1869031	2.33	0.021	0.0673203	0.8029748
LR6576	-0.1166075	0.2881897	-0.4	0.686	-0.6837679	0.4505529
AN4053	0.1945652	0.2282742	0.85	0.395	-0.2546808	0.6438113
CO8304	**0.6736978**	**0.2712683**	**2.48**	**0.014**	**0.1398389**	**1.207557**
TH7844	0.0932273	0.2285167	0.41	0.684	-0.356496	0.5429506
DC3398	0.4252155	0.2717611	1.56	0.119	-0.1096134	0.9600443
FD0907	0.5562087	0.1906217	2.92	0.004	0.1810632	0.9313541
BN2124	0.621165	0.3029182	2.05	0.041	0.0250188	1.217311
KJ9193	0.2402323	0.2293043	1.05	0.296	-0.2110409	0.6915056
PJ8974	0.563327	0.2344875	2.4	0.017	0.101853	1.024801
HX3788	0.4790173	0.245932	1.95	0.052	-0.0049796	0.9630142
JM5574	0.8491638	0.2428724	3.5	0.001	0.3711883	1.327139
GX2247	-0.2231422	0.2369649	-0.94	0.347	-0.6894917	0.2432073
US7450	0.4870539	0.3227283	1.51	0.132	-0.1480789	1.122187
XC0947	0.2196262	0.2049825	1.07	0.285	-0.1837815	0.6230338
_cons	-0.41037	0.1396445	-2.94	0.004	-0.6851919	-0.1355481

Note: Outcome from stata after conducting the regression, ee gender schid*, robust (where *schid* refers to the school ID, and *ee* refers to emotional engagement).

The schools selected for the case studies have positive and significant regression coefficients, which indicate that students in these schools have high levels of cognitive engagement. In fact, school AI2440 has the highest regression coefficient in the sample ($\beta_1 = 1.03$). The regression coefficient for school CO8304 is .67.

SECTION II – Multiple Regression Model

Although the results from the simple regression model provided a first approach to the importance of individual level factors on student engagement, the fact that a single explanatory variable was included in the regression prevented holding other (relevant) variables constant. For this reason, a multiple regression analysis was then introduced to control for other factors that could simultaneously affect the dependent variable *engagement*. A first step into the analysis was to have full understanding of how the regression model operates. For this reason, a discussion on the theory behind the Ordinary Least Squares (OLS) method is developed below.

Equation 4, which uses variables for which data was collected, explains the general model.

$$CE_i = \beta_0 + \beta_1 gender_i + \beta_2\ parents_i + \beta_3\ discipline_i + U_i$$

(*equation 4*)

where,

the dependent variable *cognitive engagement* (CE) of student i, is determined by three independent variables, *gender* of student i, *parents* of student i, and *discipline*[85] of student i, and by other *unobserved factors*, which are contained in the term U. Given that the primary interest is placed in the effect of gender, parents and discipline on CE, holding fixed all other factors affecting CE, the estimations of interest are the parameters β_1, β_2 and β_3.

For example, in the model presented above, β_1 measures the change in CE with respect to *gender*, holding other factors fixed; or similarly it can be said that one unit increase in *gender* (i.e. going from female coded as 0 to male coded as 1) changes the expected value of CE by the amount of β_1.

Even though the OLS model provides a powerful estimation of the relationship between the dependent and independent variables, it is important to consider that when estimating the coefficient (β) of the independent variables, the OLS model makes the assumption

[85] The variable *discipline* evaluates the degree to which the classroom is controlled and students are doing what their teacher expects from them, for example going to class, participating, and getting their work done.

that all factors in the unobserved error term (U) are uncorrelated with the independent variables. The assumption can be expressed as,

E(u|gender, parents, discipline)=0

Using the example described above, this assumption implies that other factors affecting CE are not related on average to *gender*, *parents* and *discipline*. When this assumption holds, it is possible to say that the independent variables in the model are exogenous. Contrarily, if the independent variables are correlated with U, then the variables are said to be endogenous and the OLS produces biased estimators.

This is the case because when there is endogeneity, the estimator adjusts the β estimate in order to satisfy the assumption that the error term is unrelated to the independent variables (i.e. the orthogonality of the error term with the regressor). To better understand the problem of endogeneity, hypothetically assume that there is a variable *self-regulation* (not included in the model), which is correlated with the independent variable *discipline*[86] and also with dependent variable *cognitive engagement*.[87] Because the variable *self-regulation* is not included in the model, its effect goes to the error term (U), and given that *self-regulation* and *discipline* are correlated, the error will also load on to the coefficient of the *discipline* variable creating a spurious correlation that can be misinterpreted.

Since the estimate β_3 for the variable *discipline* will include the effect of unmeasured causes (in this case *self-regulation*) the higher the correlation of the variable *discipline* with the *self-regulation* variable, the more biased the β_3 coefficient. It is important to notice that the β_3 estimate will not only include the effect of *discipline* (and in this case of *self-regulation*) on *engagement*, but will also include all other unobserved effects that are correlated with the variable *discipline* and predict the variable CE, and this is the reason why the β_3 coefficient could be biased downwards or upwards.

In such conditions, where the relation between the independent and the dependent variable is due, in part, to other reasons, finding a significant relation between the variables (e.g. x and y) cannot be causally interpreted. Also, the magnitude of the effect

[86] This can be the case if, for example, students who are more self-regulated are less distracted due to the misbehaviour of their classmates.
[87] This can be the case if students that self-regulate are more cognitively engaged.

could be misleading (i.e. the true coefficient can be higher or lower) and the β coefficient can have a different sign.

In this case, the research has a non-experimental design (uses a regression approach), and therefore the schools and students in the sample were not randomly selected from the population. Because schools and students were not randomly selected they are not the same on observable and unobservable characteristics, and therefore it is not possible to make *causal* claims from regression results.

To better understand why this is the case, it can be assumed that parents of all students in school one are literate while all the parents in school two are illiterate. If this is the case, and the variable *parents' literacy* (contained in the U term) influences the independent variable *discipline* and the dependent variable *cognitive engagement*, then the regression coefficient β_3 (for the variable *discipline*) can be misleading as the differences in cognitive engagement between school one and two can be due to the differences in the level of literacy of the parents and not to the variable *discipline*.

In addition to omitting important control variables from the model, there are other reasons why X might be endogenous. For example, it may be the case that X and Y are simultaneously causing each other; or that both X and Y were gathered from the same source, among others. This last issue is of special interest for this research as there is a potential endogeneity problem in the relationship between the variable *engagement* and the variables on *teachers' practices*, as students were asked to report on their level of engagement (Y) and on the practices of their teachers (X) in the same questionnaire.

Specifically, the survey asked students about how *rigorous* they thought their teachers were, how much they *trust* their teachers, if they thought their teachers *press* them to learn, if they thought their teachers were *clear* and *support* them, and finally if they thought the *discipline* in their classroom was good or not.

If the fact that students reported both X and Y implies that the relationship between X and Y is explained by other causes, then causality cannot be claimed, and it is not possible to say for example that *clarity* is causing *cognitive engagement*; instead (if β_1 is positive and significant) it can be claimed that students who think their teacher is *clear* also reported to be cognitively engaged.

In order to understand why this may be the case, it is important to review the *common-method variance* problem. Given that students rated their teachers in their practices (X) and simultaneously report on their own engagement (Y), it can be the case that *practices* cause *engagement* because they both depend on (Q) which can be, for example, the *perception* of each student. The following explanation illustrates the source of the bias in the β_1 estimates due to common source.

As *cognitive engagement* (y*) and *rigour* (x*) cannot be easily/directly observed, students are asked to report on Y and X instead. Therefore, if there is a common bias (Q) for student i (for example *perception*), those observations of Y and X will be as shown in the following equation:

$Y_i = Y_i^* + \Upsilon yQ_i \qquad Y_i^* = Y_i - \Upsilon yQ_i$

$X_i = X_i^* + \Upsilon xQ_i \qquad X_i^* = X_i - \Upsilon xQ_i$

substituting in the general equation,

$Y_i^* = \beta_0 + \beta_1 X_i^* + E_i$

$(Y_i - \Upsilon yQ_i) = \beta_0 + \beta_1 (X_i - \Upsilon xQ_i) + E_i$

$(Y_i - \Upsilon yQ_i) = \beta_0 + \beta_1 X_i - \beta_1 \Upsilon xQ_i + E_i$

$Y_i = \beta_0 + \beta_1 X_i + (E_i - \beta_1 \Upsilon xQ_i + \Upsilon yQ_i)$

(*equation 5*)

As can be seen from equation 5, the common method variance introduces a correlation between X and the error term. Consequently, the model produces a β_1 estimate that cannot be interpreted because it includes the effect of Q on X and Y, and therefore does not capture the magnitude of the causal relationship between X and Y, but instead captures just an association between both variables.

In order to avoid the *common-method variance* problem, I must have gathered the independent and dependent variables from different students, however this would result in a reduction of the sample size (already small) and in the difficulty of having panel data. I also could have measured (and included) Q in the model, but this was problematic as Q could include diverse causes. Finally, I could have conducted an instrumental variable estimation or other quasi experimental approach, however because the collection of data was limited to the variables included in the model this was not possible.

Fixed vs. random effects model

Given that the discussion about the influence of unobservable variables is of paramount importance when implementing a multi-level model, the second step of the analysis was to determine if the unobservables were related or not to the independent variables in the model. To understand whether the unobservables should be treated as fixed or random I discuss the fixed versus random effects model theory below.

When classrooms/students are regarded as *random effects*, this means they are regarded as random samples from the corresponding population. Hence, the random effects model requires the school-level residual (U_j) to be uncorrelated with any of the covariates (random effect assumption). However, the non-random selection of students into schools is an important reason for the failure of the random effects assumption.

This is the case because instead of random allocation of students into schools, more often parents choose a particular school (or a school selects a student) based on the specific characteristics of the student, the family or the school. Therefore, students with similar characteristics are likely to sort into the same school. This issue is one of particular concern because it is thought that students in the sample were not randomly clustered in the schools, and therefore the level of engagement of the students could be associated with the systematic factors that caused students to sort into the schools, either directly or indirectly through the covariates included in the model. In the case that these systematic factors are associated with the covariates, the coefficients from the model cannot be interpreted.

These systematic factors can be divided into (i) school-level variables that influence the dependent variable and that can be correlated or uncorrelated with the covariates (and that are contained in the term U_j and which vary only between schools), and (ii) other unobserved family and students' characteristics (contained in the term e_{ij} and which constitute the between-student variation in a two-level hierarchical model).[88]

Equation 6 is intended to exemplify the theory behind the random effects assumption.

$$CE_{ij} = \beta_{0j} + \beta_{1j}X_{ij} + U_j + e_{ij}$$

(*equation 6*)

[88] This is relevant for the analysis, considering the hierarchical structure of the data, where students (level 1) are nested in schools (level 2).

where,

CE_{ij} is the *cognitive engagement* of student i in school j, X_{ij} is the *self-concept* of student i in school j, β_1 is the average effect of *self-concept* (X) on cognitive engagement (Y or CE), U_j is the school-level residual (e.g. *school leadership*) and which should not be correlated with X_{ij} for the random effects assumption to hold, and e_{ij} is a pupil-level residual that contains other unobserved characteristics of the family or the student (e.g. SES) and which should not correlate with the covariate X_{ij} for the regression assumption to hold.

Considering this, it was important to examine whether systematic factors that caused students to sort into schools may have produced biased coefficients on the random effects model, which again assumes random sorting into schools. If the estimates from the random effects model were in fact biased it could be argued that the unobservables (that caused students to sort into schools) were related to the independent variables. In order to determine if the β coefficient from the random effects model was biased or not, the β coefficient of the random effects model was compared to the β coefficient from the fixed effects model, using a Hausman test.

When a fixed effects model is conducted, it is thought that each school has unique unobservable characteristics (U_j), and that those characteristics correlate with the covariates included in the model. Therefore, in order to control for the school specific effect (i.e. having omitted variables specific to the school that are correlated with the included variables), the model includes one dummy variable for each of the 18 schools. However, it is important to notice that by including dummy variables in the model, the degrees of freedom are reduced, which can cause the standard errors to increase.[89] The model in Tables 4.1, 4.2 and 4.3 is equivalent to a fixed effects model.

Given that the random effects model assumes that the unobservables and the covariates are uncorrelated, the dummy variables are omitted from the model without causing any

[89] The standard error is a measure of how representative a sample is likely to be of the population. Therefore, having a large standard error (relative to the mean) indicates that there is a lot of variability between the means of different samples, and therefore the sample might not be representative of the population.

bias to the β estimates, and instead the model specifies an additional random effect U_j when estimating β_0 and β_1.[90]

For instance, in equation 7, where CE_i is the cognitive engagement of student i, and X_i is the self-concept of the student, the addition of a random effect (U_j) allows the model to vary across schools.

$$CE_i = \beta_0 + \beta_1 X_i + e_i$$

(*equation 7*)

This is possible when both the intercept (β_0) and the slope (β_1) are allowed to vary across schools. In order to include a random intercept for CE, a component U_{0j} is added to the intercept. Therefore, the intercept changes from β_0 to $\beta_0 + U_{0j}$. This new term will calculate the intercept of the overall model fitted to the data (β_0) as well as the variability of the intercepts in different schools around the overall model (U_{0j}). Therefore, when the intercept changes from a fixed one (β_0) to a random one (β_{0j}), the initial model becomes as shown in equation 8.

$$CE_{ij} = (\beta_0 + U_{0j}) + \beta_1 X_{ij} + e_{ij} \text{ since, } \beta_{0j} = \beta_0 + U_{0j}$$

(*equation 8*)

where,

the term j reflects the level 2 variable (in this case *schools*) over which the intercept varies; and i represents the level 1 variable (in this case *students*). For example, in order to estimate the intercept of the school CO8304, the term j should be replaced by the school CO8304, as shown in equation 9.

$$\beta_{0\mathbf{CO8304}} = \beta_0 + U_{0\mathbf{CO8304}}$$

(*equation 9*)

Likewise, if a random slope for the effect of *teachers' quality* on *cognitive engagement* wants to be included, then a component U_{1j} needs to be added to the slope of the overall model (in order to measure the variability in slopes). Thus, the slope changes from β_1 to $\beta_1 + U_{1j}$. Once again, this new term estimates the slope of the overall model fitted to the

[90] It is important to consider that when the school fixed effects are omitted, they become part of the error term, causing a serial correlation, which implies that the errors are no longer independent, equally distributed and random, with a mean of 0.

data (β_1) and the variability of slopes in different schools (U_{1j}). When both the random intercept and the random slope are included, the overall model becomes as shown in equation 10.

$CE_{ij} = (\beta_0 + U_{0j}) + (\beta_1 + U_{1j}) X_{ij} + e_{ij}$

$CE_{ij} = \beta_{0j} + \beta_{1j} X_{ij} + e_{ij}$

(*equation 10*)

since,

$\beta_{0j} = \beta_0 + U_{0j}$

$\beta_{1j} = \beta_1 + U_{1j}$

Once these procedures have been performed to estimate the fixed and random effects models, a Hausman test is then conducted to compare the coefficients of both models. This tests the null hypothesis (Ho) that the β estimates from the random effects and fixed effects models are equal. Under the hypothesis that the unobservables are uncorrelated with the covariates, the βs for both fixed effects and random effects are unbiased or consistent, and therefore there should not be a significant difference between them (and random effects should be used to conduct the estimations). Contrarily, if the β coefficients are different because the β from the fixed effects model is consistent or unbiased while the β from the random effects model is inconsistent (given that it is violating the assumption of the random effects model, that the unobservables are uncorrelated with the covariate) a fixed effects model should be used.

Having this theory in mind, I conducted a regression including only *gender* as the independent variable, to establish if the unobservables would be treated as fixed or random when I conduct the multi-level model, where all the variables would be included.

Table 4.4 summarize the results of a fixed and a random effects model, where the independent variable *gender* was regressed on the dependent variable *cognitive engagement*, and also the results from the Hausman test.

The results indicate that the coefficient for the fixed effects model is -.15, while the coefficient for the random effects model is -.14. As mentioned before, in order to test whether or not these coefficients were statistically different, a Hausman test was performed. The results from the Hausman test indicate that the difference in coefficients

is not systematic. Therefore, the null hypothesis that the β estimates for the random and fixed effects models are equal cannot be rejected, and a random effects model should be used to calculate the regression coefficients.

Table 4.4. Fixed and random effects model for cognitive engagement including the Hausman test.

Results CE	Fixed effects	Random effects	Hausman test
Coefficient	-0.1512306	-0.142431	
Difference in coefficients			-0.0088
Std. error	0.0540906	0.0532803	0.0093275
P>|t|	0.006	0.008	
95% conf. interval	-0.2576816 -0.0447797	-0.2468589 -0.0380038	
chi2(1)			0.89
Prob>chi2			0.3455
sigma_u	0.3443422	0.2374068	
sigma_e	0.93206063	0.9320606	
rho	0.12009574	0.0609253	
R-sq: within	0.0257	0.0257	
R-sq: between	0.0254	0.0254	

Moreover, the rejection of the fixed effects model implies that the fact that students were not randomly sorted into schools is not a major problem, as it did not produce biased coefficients from the random effects model. The results when the independent variable *gender* was regressed on the dependent variables *behavioural engagement* (Table 4.5) and *emotional engagement* (Table 4.6) are presented below. For both types of engagement, the results from the Hausman test indicate that the difference in coefficients is not systematic.

The results presented in this section provide consistent evidence that the estimation of the hierarchical regression model should be done using a random effects model for the three types of engagement. In addition, given the focus of the research on determining the role of the school/teachers on student engagement (as opposed to the role of personal and family characteristics), the random effects approach seems more appropriate (when compared to a fixed effect approach), as it allow school characteristics to be modelled.

Moreover, given that the estimates of the school effects (U_j) are of major interest for this research, and that the accuracy of this estimation depends on the sample size of each school, is it important to notice that when a random effects model is used it is possible to compute school effects that are precision-weighted. The implication of this is that the school effects estimates of small samples (like the ones in this research) are not given excessive weight and therefore it is possible to interpret the effect of the school effect with more confidence.

Table 4.5. Fixed and random effects model for behavioural engagement including the Hausman test.

Results BE	Fixed effects	Random effects	Hausman test
Coefficient	-0.2171883	-0.2085057	
Difference in coefficients			-0.0086826
Std. error	0.0508857	0.0502297	0.0081441
P>|t|	0.000	0.000	
95% conf. interval	-0.3173318 -0.1170448	-0.3069541 0.1100572	
chi2(1)			1.14
Prob>chi2			0.2864
sigma_u	0.33134102	0.23086097	
sigma_e	0.87683428	0.87683428	
rho	0.12495302	0.06482728	
R-sq: within	0.058	0.058	
R-sq: between	0.0149	0.0149	

Table 4.6. Fixed and random effects model for emotional engagement including the Hausman test.

Results EE	Fixed effects	Random effects	Hausman test
Coefficient	-0.0313558	-0.0319912	
Difference in coefficients			0.0006354
Std. error	0.0464723	0.0458988	0.007278
P>|t|	0.500	0.486	
95% conf. interval	-0.1228137 0.0601021	-0.1219512 0.0579688	
chi2(1)			0.01
Prob>chi2			0.9304
sigma_u	0.34601535	0.28766993	
sigma_e	0.80078476	0.80078476	
rho	0.15733156	0.11429948	
R-sq: within	0.0015	0.0015	
R-sq: between	0.0006	0.0006	

Although the results indicate that a random effects model should be used to conduct the analysis, it is important to consider that the selection mechanisms are still not fully understood, and that the regression assumptions do not necessarily hold. Therefore, by no means the β coefficients can be interpreted as the covariates' *effects* on student engagement (see Clarke, Crawford, Steele, & Vignoles, 2010).

Conducting a random effects model using individual level data on students and teacher practices, and school-level data

Considering the evidence presented above, the final step of the analysis was to include all variables for which data was collected, in a multi-level model using random effects. Conducting the model allowed answering the second research question, which enquires

about the *teachers' practices* and *school characteristics* that promote student engagement in the selected 18 classrooms.[91]

By using this model, it is expected that the school-level residuals contain less omitted school-level factors that are correlated with the covariates included in the model (this is also the case for the individual-level residuals). The theory of the model used in the subsequent analysis is briefly explained below.

Equation 11 exemplifies the theory behind the random effects model.

$CE_{ij} = \beta_0 + \beta_1 X1_{ij} + \beta_2 X2_j + U_j + e_{ij}$

(*equation 11*)

where,

CE_{ij} is the *cognitive engagement* of student i in school j (I=1,…,315; j=1,…,18), β_0 is the regression intercept, X_{ij} represents the covariates that vary between individuals (e.g. *gender*), X_j represent the covariates that vary only between schools (e.g. *fulltime*), β_1 and β_2 are the respective coefficients for X_{ij} and X_j, U_j is the effect of the school j, and e_{ij} is the individual-level residual.

Specifically, the random effects model estimated the association between the dependent variable *engagement* and the individual-level independent variables *gender*, *parents*, *expch6*, *qualiftch6*, *gendertch*, *trust*, *rigour*, *clarity*, *acpersonalism*, *discipline*, and *acpress* (level 1),[92] and the school-level independent variables *number6*, *multi-grade*, *fulltime*, *library*, *complab*, *expprincipal* and *remoteness* (level 2).[93] From the school-level

[91] The model included individual-level variables regarding students (e.g. *gender*); ones regarding teachers' characteristics (e.g. *expch6*); ones reported by students regarding their teachers' practices (e.g. *clarity*); and school-level variables (e.g. *multi-grade*).

[92] *Gender* refers to the gender of the students and *parents* refers to the emotional and developmental support provided by parents. E*xpch6* alludes to the 6th-grade teacher's years of experience; *gendertch* refers to his/her gender (1=male, 0=female); *qualiftch6* refers to the 6th-grade teacher's qualification (1=Licensure, 0=Normalista). *Trust* alludes to the mutual trust and respect between students and teacher, *rigour* to the teacher encouraging students to make connections and seek multiple perspectives in coursework, *clarity* to supporting achievement with clear learning goals and instruction, *acpersonalism* to the teacher-student connection in the classroom and support in achieving academic goals, *discipline* to the teacher's ability to manage student behaviour, and *acpress* to the teacher's expectations that students do their best and meet academic demands.

[93] *Number6* refers to the number of 6th-grade students. *Multi-grade* is 1 if there is one teacher per classroom and 0 if at least one teacher is responsible for teaching more than one grade level at a time. *Fulltime* is 1 if students attend school from 8:00 a.m. to 4:00 p.m., and 0 if students attend school from 8:00 a.m. to 12:30 p.m. *Library* is 1 if the school has a library, and 0 if it does not. Likewise, if *complab* is 1, the school has a computer laboratory and if it is 0 the school does not have one. *Expprincipal* refers to the years the head teacher has held that position at that school, and *remoteness* provides a measure in kilometres of the distance between the school and the state capital.

variables summarized in Box 3.1, the only one not included in the model was *numbersch*, as it is highly correlated (r=0.76) with the variable *number6* and it was important to avoid multicollinearity. See Section III: Factors Facilitating Student Engagement' in Chapter 1 (the literature review) for evidence on the importance of these variables for student engagement.

Following the theory, I estimated the association between each type of engagement and the independent variables. Table 4.7 presents the results for *cognitive engagement*.

The results indicate that the variables included in the model explain 44 per cent of the variation in cognitive engagement within schools, and about 89 per cent of the variation between schools. Although these results show an increase in the predictive power of the model, it is important to acknowledge that this may be the case because the independent variable *academic press* and the dependent variable *cognitive engagement* were measured simultaneously (i.e. from the students using the survey), and also because both variables may to some degree be measuring the same construct, which may be causing the high correlations.The variable *parents* is statistically significant and positively related to cognitive engagement. The regression coefficient indicates that a unit increase in the measure of support provided by parents corresponds to an increase in the cognitive engagement of the students of .15 units. The results also revealed that three of the six variables on teacher practices are statistically significant and positively related to cognitive engagement. These variables are *clarity*, *acpress*, and *acpersonalism* (regression coefficients .27, .21 and .15, respectively).

Table 4.7. Random effects model for cognitive engagement.

Random-effects GLS regression				Number of obs = 315		
Group variable: newschid				Number of groups = 18		
R-sq: within = 0.4405				Obs per group: min = 6		
between = 0.8989				avg = 17.5		
overall = 0.4850				max = 38		
Wald chi2(18) = 278.76						
corr(u_i, X) = 0 (assumed)				Prob > chi2 = 0.0000		
ce	**Coef.**	**Std. err.**	**t**	**P>|t|**	**[95% conf. interval]**	
gender	-0.0360411	0.0419558	-0.86	0.390	-0.1182728	0.0461907
parents	0.1579757	0.050881	3.1	0.002	0.0582507	0.2577007
ExpTch6	-0.030527	0.0492647	-0.62	0.535	-0.127084	0.06603
QualifTch6	0.0998523	0.0594155	1.68	0.093	-0.0165999	0.2163045
GenderTch	-0.0410945	0.0661764	-0.62	0.535	-0.1707979	0.0886088
Trust	0.0649055	0.0533857	1.22	0.224	-0.0397285	0.1695396
Rigour	-0.0918643	0.0579676	-1.58	0.113	-0.2054788	0.0217502
Clarity	0.2792901	0.0634809	4.4	0.000	0.1548698	0.4037103
AcPersonalism	0.1510883	0.0664014	2.28	0.023	0.0209439	0.2812326
Discipline	-0.0204242	0.0429762	-0.48	0.635	-0.104656	0.0638076
AcPress	0.2195045	0.0604564	3.63	0.000	0.1010122	0.3379967
number6	0.0576846	0.081206	0.71	0.477	-0.1014763	0.2168455
multi-grade	-0.118055	0.0571655	-2.07	0.039	-0.2300973	-0.0060126
fulltime	-0.0719122	0.0522594	-1.38	0.169	-0.1743387	0.0305142
library	0.0415231	0.0724198	0.57	0.566	-0.1004172	0.1834634
complab	-0.0277767	0.0717758	-0.39	0.699	-0.1684547	0.1129012
expprincipal	0.0104008	0.0524393	0.2	0.843	-0.0923783	0.1131798
remoteness	0.0394538	0.0672056	0.59	0.557	-0.0922667	0.1711743
_cons	-0.012396	0.0401036	-0.31	0.757	-0.0909976	0.0662055
sigma_u	0					
sigma_e	0.7144822					
Rho	0 (fraction of variance due to u_i)					

Note: Outcome from stata after conducting the regression, xtreg ce (individual-level variables, school-level variables) re.

In the case of the variable *clarity*, these results imply that a unit increase in the teachers' *clarity* to express learning goals and deliver instruction, corresponds to an increase in the cognitive engagement of the students of .27 units. Similarly, a unit increase in the teachers' *academic press* to students to do their best and meet academic demands corresponds to an increase in cognitive engagement of .21 units. The findings also suggest that students of teachers who connect with them in the classroom and support them in

achieving academic goals (i.e. provide them with *academic personalism*), report having .15 units more of cognitive engagement than students who do not receive this support.

Table 4.8. Random effects model for behavioural engagement.

Random-effects GLS regression				Number of obs = 315		
Group variable: newschid				Number of groups = 18		
R-sq: within = 0.5275				Obs per group: min = 6		
between = 0.8817				avg = 17.5		
overall = 0.5654				max = 38		
Wald chi2(18) = 385.12						
corr(u_i, X) = 0 (assumed)				Prob > chi2 = 0.0000		
be	**Coef.**	**Std. err.**	**t**	**P>|t|**	**[95% conf.**	**interval]**
gender	-0.0975963	0.0370609	-2.63	0.008	-0.1702344	-0.0249582
parents	0.1116594	0.0449449	2.48	0.013	0.023569	0.1997499
ExpTch6	-0.0151542	0.0435171	-0.35	0.728	-0.1004463	0.0701378
QualifTch6	0.131428	0.0524837	2.5	0.012	0.0285618	0.2342941
GenderTch	0.0609399	0.0584558	1.04	0.297	-0.0536314	0.1755112
Trust	0.0802086	0.0471574	1.7	0.089	-0.0122182	0.1726354
Rigour	-0.035741	0.0512048	-0.7	0.485	-0.1361005	0.0646185
Clarity	0.3515693	0.0560748	6.27	0.000	0.2416647	0.4614738
AcPersonalism	0.087122	0.0586546	1.49	0.137	-0.0278389	0.2020829
Discipline	0.0029497	0.0379623	0.08	0.938	-0.0714551	0.0773545
AcPress	0.1826514	0.0534031	3.42	0.001	0.0779832	0.2873196
number6	0.2909766	0.071732	4.06	0.000	0.1503844	0.4315687
multi-grade	-0.2436457	0.0504962	-4.83	0.000	-0.3426165	-0.144675
fulltime	-0.0562571	0.0461625	-1.22	0.223	-0.1467338	0.0342196
library	0.2455555	0.0639709	3.84	0.000	0.1201749	0.3709361
complab	-0.1266022	0.063402	-2.00	0.046	-0.2508678	-0.0023367
expprincipal	0.0029601	0.0463214	0.06	0.949	-0.0878281	0.0937483
remoteness	0.1945729	0.0593649	3.28	0.001	0.0782198	0.310926
_cons	-0.0015003	0.0354248	-0.04	0.966	-0.0709316	0.0679311
sigma_u	0					
sigma_e	0.62834797					
Rho	0 (fraction of variance due to u_i)					

Note: Outcome from stata after conducting the regression, xtreg be (individual-level variables, school-level variables) re.

Finally, the results indicate that students in schools that do not have a multi-grade class structure have .11 units less of cognitive engagement, than students attending school with

multi-grade classes.[94] Table 4.8 presents the results from the regression when data on behavioural engagement was used in the estimations.

Similar to the increase in the predictive power of the model for cognitive engagement, the increase in the power of this model (which now explains 52 per cent of the variation within schools and 88 per cent of the variation between schools) may be caused by having measured simultaneously the independent variable *academic press* and the dependent variable *behavioural engagement*, and also by the fact that both variables may to some degree be measuring the same construct, which may explain the high correlations.

The variables *parents*, *clarity*, *acpress* and *multi-grade*, which are significant for cognitive engagement, are also significant and positively related to the behavioural engagement of the students (except by *multi-grade* which has a negative correlation coefficient).[95] Although the variable *gender* is also statistically significant, the correlation coefficient is close to 0 (r=-0.09), which indicates that the correlation between both variables is weak. The variable *qualiftch6* is statistically significant and has a regression coefficient of 0.13, which indicates that students whose teachers had a Licensure degree reported having 0.13 units more of behavioural engagement, than students of teachers with a Normalista degree.

Contrary to the results for cognitive engagement where only the variable *multi-grade* was statistically significant, the majority of the characteristics of the school were statistically significant when data on behavioural engagement was used. This is the case of the variables *number6*, *library*, *complab* and *remoteness* (the correlation coefficients are 0.29, 0.24, -0.12, 0.19, respectively). Table 4.9 presents the results from the regression when data on emotional engagement was used in the estimations.

[94] This is the case because the correlation coefficient is negative, and the variable was coded 1 for schools without multi-grade classes, and 0 for schools with multi-grade classes.

[95] The negative coefficient of the variable *multi-grade* should be interpreted as students enrolled in schools that do not have a multi-grade class structure having .24 units less of behavioural engagement, than students attending schools with multi-grade schemes. It is important to remember that students can be enrolled in a school with a multi-grade structure, but still be part of a classroom where one teacher is responsible for one grade only. This is the case because a *multi-grade* school is defined as one where *at least* one teacher in the school is responsible for teaching more than one grade level. Therefore, it is possible that a school has one teacher responsible for 1st and 2nd grade, one teacher responsible for 3rd and 4th grade, but one teacher for 5th grade, and one teacher for 6th grade. Thus, the school will be categorized as a multi-grade school, even though the students in 6th grade in that school do not share the classroom with any other grade level.

Table 4.9. Random effects model for emotional engagement.

Random-effects GLS regression				Number of obs = 315		
Group variable: newschid				Number of groups = 18		
R-sq: within = 0.2753				Obs per group: min = 6		
between = 0.6779				avg = 17.5		
overall = 0.3339				max = 38		
Wald chi2(18) = 148.36						
corr(u_i, X) = 0 (assumed)				Prob > chi2 = 0.0000		
ee	**Coef.**	**Std. err.**	**t**	**P>|t|**	**[95% conf.**	**interval]**
Gender	0.0410601	0.0415084	0.99	0.323	-0.0402948	0.1224151
Parents	-0.0241866	0.0503385	-0.48	0.631	-0.1228483	0.074475
ExpTch6	-0.082388	0.0487394	-1.69	0.091	-0.1779155	0.0131394
QualifTch6	0.142314	0.0587819	2.42	0.015	0.0271035	0.2575245
GenderTch	-0.0757603	0.0654708	-1.16	0.247	-0.2040806	0.0525601
Trust	0.1566049	0.0528165	2.97	0.003	0.0530865	0.2601234
Rigour	0.159186	0.0573496	2.78	0.006	0.046783	0.2715891
Clarity	0.1138103	0.062804	1.81	0.070	-0.0092833	0.2369039
AcPersonalism	0.0369525	0.0656934	0.56	0.574	-0.0918042	0.1657092
Discipline	0.0796061	0.042518	1.87	0.061	-0.0037276	0.1629398
AcPress	0.0450615	0.0598117	0.75	0.451	-0.0721674	0.1622903
number6	0.1204305	0.0803401	1.50	0.134	-0.0370332	0.2778943
multi-grade	-0.1067655	0.056556	-1.89	0.059	-0.2176132	0.0040822
fulltime	0.0361594	0.0517021	0.70	0.484	-0.0651749	0.1374937
library	0.1065327	0.0716477	1.49	0.137	-0.0338941	0.2469595
complab	-0.1069237	0.0710105	-1.51	0.132	-0.2461016	0.0322542
expprincipal	-0.0111809	0.0518801	-0.22	0.829	-0.1128641	0.0905022
remoteness	-0.0726657	0.066489	-1.09	0.274	-0.2029817	0.0576503
_cons	-0.0255941	0.039676	-0.65	0.519	-0.1033576	0.0521693
sigma_u	0					
sigma_e	0.69026371					
rho	0 (fraction of variance due to u_i)					

Note: Outcome from stata after conducting the regression, xtreg ee (individual-level variables, school-level variables) re.

The results revealed that while the R-squared within school for cognitive and behavioural engagement is between 40 and 50 per cent, this estimation is 27 per cent when data on emotional engagement is used. The R-squared between schools for emotional engagement is 67 per cent. In addition, the results indicate that the variables *qualftch6*, *trust* and *rigour* have positive and statistically significant coefficients. The findings

revealed that a unit increase in *trust* and *rigour* correspond to an increase in emotional engagement of 0.15 units, and that a unit increase in *qualftch6* (i.e. moving from a teacher that is Normalista to one who has a Licensure) corresponds to an increase in emotional engagement of 0.14 units.

The variables *multi-grade*, *discipline*, *clarity* and *exptch6* are nearly significant with p-values of .05, .06, .07 and .09, respectively. Given that the coefficient for the variables *multi-grade* and *exptch6* are negative, it can be argued that a unit increase in *multi-grade* (i.e. being in a school with complete organization) and a unit increase in the years of experience of the teacher, correspond to a decrease in emotional engagement of .10 and .08 units respectively. Contrarily, a unit increase in *discipline* and *clarity* corresponds to an increase in emotional engagement of .07 and .11 units, respectively.

A summary of the R-squared in each model is presented in Table 4.10. Notice that this table reports the results of a random effects model that was not discussed, and which included individual and school level variables and not data on teacher practices (column 4). This model was conducted to compare its predictive power to the one of the final model, which included all variables for which data was collected.

Table 4.10. Summary of the R-squared estimations by model.

R-squared	OLS (gender)			Random effects (gender)			Random effects (gender, parents and school characteristics)			Random effects (all individual-level and school-level variables, including teacher practices)		
	CE	**BE**	**EE**	**CE**	**BE**	**EE**	**CE**	**BE**	**EE**	**CE**	**BE**	**EE**
Within				2%	5%	0%	21 %	25 %	7%	44 %	52 %	27 %
Between				2%	1%	0%	64 %	45 %	34 %	89 %	88 %	67 %
Overall	11 %	15 %	13 %	2%	4%	0%	26 %	28 %	11 %	48 %	56 %	33 %

In order to analyse the results presented in Table 4.10, it is important to remember that the estimation *within* refers to the proportion of the variance in *engagement* within schools, that is, the individual-level variance that occurs for example when students attending the same school display different abilities or effort. The estimation *between* refers to the proportion of the variation explained by the schools themselves. The

variation between schools (in this case in terms of the engagement level of the students) can result, for example, from differences in the socioeconomic and cultural characteristics of the communities that are served by the schools, or from differences in the quality or the effectiveness of instruction provided by different schools.

The results indicate that the proportion of variance that is attributed to differences between schools is higher that the proportion of the variance that is attributed to differences within schools, which suggests that schools matter for student engagement. Also, the fact that there is less variation among students within schools may indicate for example that students are grouped systematically in schools in which most students have relatively similar engagement.

In particular, the results suggest that schools (or the between schools variation) explain 89, 88 and 67 per cent of the variance of the cognitive, behavioural and emotional engagement, respectively, while individual variables (or within school variations) explain 44, 52 and 27 per cent of the variance (for the same types of engagement).

It is worth noting that the model explains a greater proportion of the variation in behavioural engagement than in the other two types of engagement. In particular, the R-squared (overall) for behavioural engagement is 56 per cent, while the estimations for cognitive and emotional engagement are 48 and 33 per cent, respectively. This is the case, because contrary to the finding for cognitive and emotional engagement, the school characteristics (e.g. having a library) were found to be statistically correlated to this type of engagement.

Table 4.11 summarizes the variables that were found to be statistically significant at the 0.05 level, after conducting the last model. The regression coefficients nearly significant are highlighted in grey. The coefficients for the variables *fulltime*, *gendertch*, and *expprincipal* were not found to be statistically significant for any type of engagement.

Analysis of the results

Given that the results do not allow for any conclusions about causality, the analysis focuses on the factors that were reported as important to promote engagement (i.e. on the variables that co-occurred in the model). The variables that may be causing systematic bias in the model are also discussed in this analysis.

Teachers' practices

The teacher practice *clarity* showed the highest correlation with the three types of engagement. The correlation coefficient for this variable is 0.27 for cognitive engagement, 0.35 for behavioural engagement, and 0.11 for emotional engagement (although the p-value for emotional engagement is 0.07). Thus, the results show that students who are cognitively, behaviourally and emotionally engaged tend to believe that their teacher is clear.

Table 4.11. Summary of the statistically significant variables by type of engagement.

Variable	CE	BE	EE
Clarity	0.27	0.35	0.11 (p-value 0.07)
Multi-grade	-0.11	-0.24	-0.10 (p-value 0.05)
QualifTch6	0.09 (p-value 0.09)	0.13	0.14
Parents	0.15	0.11	
AcPress	0.21	0.18	
Trust		0.08 (p-value 0.08)	0.15
AcPersonalism	0.15		
Number6		0.29	
Library		0.24	
Complab		-0.12	
Remoteness		0.19	
Gender		-0.09	
Rigour			0.15
ExpTch6			-0.08 (p-value 0.09)
Discipline			0.07 (p-value 0.06)
Fulltime	-	-	-
GenderTch	-	-	-
Expprincipal	-	-	-

To better understand this outcome, it is important to remember that the items measuring the variable *clarity* asked students about how much they learn from feedback on their work, if it is clear what they need to do to get a good grade, if they know what their

teachers want them to learn, if the homework helps them learn the course material, and finally, if the work they do in class is a good preparation for the test.

Likewise, *academic press* has a positive and significant relation with the cognitive and behavioural engagement of the students. The items measuring academic press asked students if they thought their teachers expected them to work hard and do their best at all times, if their teachers want them to become better thinkers and not just memorize things, if they thought they were challenged in their classes and if they thought they have to work hard to do well. Given that the correlation coefficients are 0.21 for cognitive engagement and 0.18 for behavioural engagement, it can be suggested that students who report to be cognitively and behaviourally engaged, also report to experience *academic press* from their teachers.

In addition, the results indicate that the variables *academic personalism*, *trust* and *rigour* are correlated with one of the three types of engagement. In particular, *academic personalism* is positively and significantly correlated with the cognitive engagement of the students (r=0.15). This means that students who report to be cognitively engaged, also report that their teachers were willing to give extra help on schoolwork, to help them catch up when they were behind and to explain things differently if they did not understand a particular topic.

The variable *trust* is correlated with the emotional engagement of the students (r=0.15). Items measuring *trust* asked students if they feel safe and comfortable with their teachers at the school, if their teachers keep their promises, and if they always listen to their ideas and treat them with respect. It is thought that the students' perception of having a teacher who they can trust, promotes emotional engagement as this type of engagement refers to the students' belief that people in their school are friendly to them, that they are a real part of their school, and that people in their schools treat each other with respect (the results for this variable are nearly significant for behavioural engagement r=0.08 and p-value=0.08).

The variable *rigour* also appears to be positively and significantly related with emotional engagement (r=0.15). As items measuring *rigour* asked students if their teachers often require them to explain their answers, and encourage them to consider different solutions

or points of view, and the items on emotional engagement are related with the relationships between teachers and students, the results appear to be contra intuitive.

The variable *discipline* was the only one within the teachers' practices not found to be statistically related to any type of student engagement (although the p-value for emotional engagement is 0.06). To measure the disciplinary climate in the classroom, students were asked if they were distracted from work by other students, if their classes were out of control and if their classmates behave the way their teachers want them to. Since these results contradict vast evidence suggesting that classrooms with more disciplinary problems are less conducive to learning (as disruptions affect students' concentration and engagement), it is crucial to have a better understanding of why discipline did not appear to promote student engagement, if the students and teachers corroborate this idea during the interviews, or what other factors may be influencing the results.

Regarding the teachers' characteristics included in the model (i.e. *qualifch6*, *exptch6* and *gendertch*), only *teacher's qualification* appears to have a significant relationship with student engagement. In fact, this variable has a positively and significant correlation with the three types of engagement. The correlation coefficient is 0.13 for behavioural engagement, 0.14 for emotional engagement and 0.09 for cognitive engagement (although the p-value is 0.09). Given that the variable was coded 0/1 (0=Normalista, 1=teachers with Licensure), the results indicate that students of more qualified teachers reported to be more engaged.

In sum, the findings suggest that from the factors related to teacher practices, *clarity*, *academic press* and *academic personalism* are positively related to cognitive engagement; that *clarity*, *academic press*, and *qualiftch6* are all potential promoters of behavioural engagement; and that *qualiftch6*, *trust* and *rigour* are positively correlated with the emotional engagement of the students.

School characteristics

Other important findings are related to the relationship between the school resources/characteristics and the engagement of the students. In general, the results indicate that the schools' characteristics (i.e. library, computer laboratory, number of students in 6th grade, organization/multi-grade, time students spend in school, and head

teacher's experience) are more relevant for the behavioural engagement of the students than for the other two types of engagement.

In particular, the results indicate that *library*, *number6*, and *complab* are only relevant for behavioural engagement (correlation coefficients of 0.24, 0.29, and -0,12 respectively). In the case of the variable *library*, the findings suggest that students in schools with a library reported to be more behaviourally engaged. Given that one of the two schools in the case studies have a library it will be possible to investigate further what the teacher or school's practices are that may be leading to these results. Moreover, it is important to determine why the variable *library* is not relevant for cognitive engagement and whether the fact that some schools do not have a library may affect the engagement of the students.

The variable *number6* (i.e. the number of students in the 6th-grade classroom) is also positively related with the behavioural engagement of the students. This means that as class size got bigger, students reported to be more behaviourally engaged. Again, these results are worthy of further investigation during the qualitative analysis. Given that items measuring behavioural engagement asked students whether they pay attention in class, whether they always study for the test, and whether they are hard workers, among others, it will be crucial to understand if there are particular practices of the teachers that are different in bigger classes. For example, is it the case that bigger classes allow for more collaborative work and require more discipline and order, and this in turn promotes behavioural engagement? Is it the case that peer pressure exerts more influence in terms of behavioural engagement in bigger classrooms? Given that one of the classrooms in the case study has 11 students and the other three have 23 students it will be possible to examine these aspects.

On the other hand, and given that the model is highly endogenous, there may be other variables influencing the results. For example, it can be the case that the bigger classes are bigger because the school has a good reputation in the community, and more parents are willing to send their children there. If this is true, pupils in this (bigger) classroom may be more behaviourally engaged, not because they are in bigger classrooms, but because their parents value education enough to find a place in that popular school, and therefore care about their education and are themselves promoting their engagement at school.

In the case of the variable *complab*, the correlation with behavioural engagement appears to be negative. Therefore, students in schools with a computer laboratory reported to be less behaviourally engaged. This result appears to be contra intuitive; however, there could be diverse reasons for it. For instance, computer programs used during the ICT classes may not be tailored to the learners, or the content may not be relevant. Also, it could be the case that the teachers do not integrate the technology in formal class-work or that pupils are not exposed to new activities where they can be creative and learn new skills. More fundamentally, students may not be engaged if the computers are in poor condition or if access to the computer laboratory is uncommon because there is no power supply in the community. Given that one of the schools in the case study has a computer laboratory, it will be possible to have a better understanding of unobservables or teachers' practices influencing the results.

The variable *multi-grade* is negatively correlated with the three types of engagement (although the p-value for emotional engagement is 0.05). Since the variable was coded 0/1 (0=for multi-grade schools, 1=non-multi-grade schools), the results indicate that students in multi-grade schools reported to have 0.11 more units on cognitive engagement, 0.24 more units on behavioural engagement, and 0.10 more units on emotional engagement than students in non-multi-grade schools. Also, seven of the 18 schools in the sample are multi-grade, and in five of those seven schools, the students show relative high levels of cognitive, behavioural and emotional engagement.

An important remark about the results for multi-level schools, is that in three of the five schools categorized as multi-grade that showed relative high levels of student engagement, the 6th-grade classrooms did not have a multi-grade structure (i.e. in schools CO8304, PJ8974 and BN2124). This implies that the analysis should not be solely focused on the practices of teachers serving two grade levels at a time and which might be promoting engagement, but should also focus on students' characteristics, or characteristics of the communities that might be influencing these results.

This should also be the case as none of the school-level variables included in the model, which were shown to promote engagement, were found to be better in multi-grade schools. For example, in multi-grade schools there are more *Normalistas* than teachers with *Licensure*; multi-grade schools are on average the same distance away from the

capital than schools with complete organization; and students have the same access to library facilities.

In addition, the results indicate that the variable *fulltime* is not related to any type of student engagement. These results imply that the three extra hours of instruction that students in full-time schools are receiving might not be promoting their engagement. Given that the range of facilities is appreciably more ample in full-time schools and teachers have more credentials in this type of school, it is important to understand what the activities that students are exposed to during the extra hours at school are, and if it is the case that pupils are not enjoying those activities. These findings may suggest that there are different ways in which students perform well apart from being engaged. In this case, some of the schools may have positive value-added scores because their students spend more time in schools (which contribute to achievement) and not because they are more engaged.

The variable *remoteness* is positively correlated with the behavioural engagement of the students. This means that students attending schools located in more remote areas reported to be more behaviourally engaged than students in less isolated schools. As mentioned at the beginning of the chapter, there were concerns that the variable *remoteness* may not capture accurately the SES of the students, as it may not be able to distinguish for example between families with more or less educated parents. Given the results, and the vast evidence suggesting the importance of SES, I think that by using this crude measure of SES, its importance on the engagement level of the students could have been underestimated.

Individual-level variables

Regarding the individual-level variables included in the model, the results indicate that the variable *parents* is statistically and positively correlated with the cognitive and behavioural engagement of the students. These findings imply that students who reported to be cognitively and behaviourally engaged, also reported receiving emotional and developmental support from their parents. Although these results are consistent with a large body of literature suggesting the crucial role of parenting on students' performance, the data from both students and teachers regarding the specific actions of parents to promote engagement will be central in the analyses of the qualitative data.

The fact that the variable *parents* is not related to the emotional engagement of the students may be explained by the fact that items on emotional engagement enquired about the relationship of the students with members of the school, and the perception of the students in this regard may not be related with how much support they receive from their parents. For instance, the items to measure emotional engagement asked students if people in their schools noticed when they were good at something, or if they feel like a real part of the school, among others.

As for the variable *gender*, it has a significant but small association with the behavioural engagement of the students. Provided that the correlation coefficient is negative (-0.09), this result indicates that males have .09 less units of behavioural engagement than females (as *gender* was coded 0=female, 1=male).

Although this result is in line with literature from Mexico indicating that females tend to participate more actively in the academic endeavours than males, it is central for the analysis to learn from the interviews if the teachers agree with this finding, and if this is the case how the behaviours of girls and boys are different and to what factors they attribute this difference.[96] Equally important will be to investigate whether the teachers also agree with the fact that boy and girls are *not* different in terms of their cognitive and emotional engagement.

CONCLUSION

This chapter examined the relationship between student engagement and a set of individual and school level characteristics. The results revealed that the teachers of engaged students were *clear* and exerted *academic press.* The practice *clarity* was found to be relevant for the students' cognitive, behavioural and emotional engagement, while the practice *academic press* was found to be relevant for their cognitive and behavioural engagement. Behaviourally and emotionally engaged students also perceived their teacher as an individual they can *trust*. The analysis also suggests a positive correlation between the practice *academic personalism* and the students' cognitive engagement.

[96] For example, it is important to understand how boys and girls react to disciplinary practices, if they are equally proficient in all subjects and how their attitudes towards learning, aspirations and confidence differ, among others.

In addition, students of more qualified teachers reported to be more engaged than the students of teachers with a *normalista* degree. These results are illuminating as the literature typically focuses on single mechanisms implemented by the teachers to engage students, while this chapter's findings indicate that, instead, teachers employ a repertoire of practices that coupled with their personal characteristics promote student engagement.

Other findings in this chapter are related to the relationship between school resources/characteristics and student engagement. The results indicate that school characteristics are mostly relevant for promoting students' behavioural engagement. Specifically, students in schools with a library, bigger classes, multi-grade schemes and located in more remote areas, were more behaviourally engaged than their peers in schools without these characteristics. In addition, the results suggest that attending a school that was part of a full-time programme was not related to students' engagement level. Finally, engaged students reported receiving emotional and developmental support from their parents and females reported being more behaviourally engaged than males.

These results provide a first insight into the mechanisms through which the students in the selected schools engaged in academic endeavours. However, given that it is not possible to claim causality from these results, the triangulation with the case studies' evidence allowed to determine if the findings from both sources are consistent, and therefore improve the accuracy of the inferences made from the quantitative data.

The results from the qualitative analysis should also provide additional information about the importance of unobservables in the correlations found in this chapter. For instance, it is expected that using both approaches in tandem will help, clarifying the relevance of variables such as the SES of the students, and identifying the factors that are promoting engagement in multi-grade schools. Finally, having a better understanding of the results presented in this chapter will allow me to determine if the theoretical proposition of the research, which states that marginal schools outperform their peers on the national standardized test due to the ability of the teachers to engage students in academic tasks, is fulfilled in this sample of schools.

CHAPTER 5: TEACHER PRACTICES AND CONTEXTUAL FACTORS PROMOTING AND CHALLENGING STUDENT ENGAGEMENT IN THE FIRST CASE STUDY

The final phase of the research consists of the implementation of two case studies to provide an answer to the *third research question*, which enquires about the perspectives and practices of teachers in the selected schools where students showed relative high levels of cognitive, behavioural and/or emotional engagement. As mentioned in the previous chapter, schools CO8304 and AI2440 were selected to participate in this stage. This chapter is devoted to presenting the results for school AI2440, while Chapter 6 focuses on presenting the results for school CO8304.

Similarly to the results from the quantitative analysis, the results in Chapters 5 and 6 cannot be generalized. However, it is expected that the results contribute to a better understanding of (i) the teacher practices through which students become engaged and learn, and what practices facilitate each type of engagement; (ii) the contextual factors that promote student engagement in these classrooms; and (iii) the relationship between student engagement and achievement.

Specifically, it is expected that the results from both schools shed light on how the teacher practices included in the econometric model (i.e. academic personalism, academic press, clarity, rigour, discipline and trust) are actually materialized at the classroom level and how they translate into higher levels of engagement (or if they do not appear to be relevant for engagement). It is also expected that the analysis identifies other factors such as leadership or parental support, not included in the econometric model, that may be promoting student engagement and achievement in the schools, and which could provide an alternative explanation for the correlations found in the quantitative analysis and enrich the discussion on the enablers of student engagement.

This chapter is divided into two sections. The first section discusses the selection of the instrument used to collect qualitative data, as well as its administration, and the methods used in the subsequent analysis (in both schools). The second section presents the results, that is, the perspectives and practices that promote engagement in school AI2440. The chapter concludes with an examination of the findings in light of the quantitative results.

SECTION I – Data Collection

Selecting the instrument to answer research question three

Once the two schools to be used in the case studies were identified, the next step was finding an instrument that allowed gathering data to answer the *third* research question. Given that this research identifies classroom management, instructional practices, and the teacher–student relationship as promoters of student engagement, one of the criteria to select the instrument was its ability to capture those domains. The instrument also needed to fit the exploratory nature of the research question.

A first option to gather data on teacher practices was to conduct both interviews and observations. However, implementing both instruments was later discarded given the time constraints to collect and analyse qualitative data (considering that during the fieldwork, collection and analysis of quantitative data also took place). Observations were discarded, given a practical concern related to the fact that I would be the only observer, and therefore it would not be possible to examine the extent of the agreement between two observations, which could affect the reliability of the data.

Most importantly, conducting interviews allowed me to give priority to the reflections of the participants about their experiences in the school, and how they related those experiences to student engagement. Given that interviews were used as a follow up to the survey (following the mixed methods design), the fact that participants were able to elaborate on matters they considered important helped me build on the quantitative data. By using both approaches the study was strengthened, as I was able to amplify my understanding of the promoters and challenges to student engagement.[97]

Considering the importance of gathering in-depth interview data, semi-structured interviews were selected as the collection method. According to Robson (2011), this type of interview 'offers the possibility of modifying one's line of enquiry, following up interesting responses and investigating underlying motives in a way that other self-administered questionnaires cannot' (p.280). By using this approach, it was possible to

[97] Moreover, by conducting interviews, contextual factors important for student engagement (and difficult to capture using observations or surveys) could emerge from the data.

specify in advance the topics to be covered during the interview using an outline form,[98] and at the same time modifying the sequence, rephrasing questions, clarifying answers and seeking elaboration, all of which lead to more accurate and detailed responses.[99]

One of the limitations of using interviews is the bias and lack of skills of the interviewer. In order to minimize the effect of these issues on the quality of the data, prior to the fieldwork I conducted an interview with a 6th-grader from a private school, and a pilot test (where I interviewed a teacher and a group of 6th-grade students).[100] In addition, during the fieldwork I followed a logistic protocol that included instructions such as memorizing the questions, being completely familiarized with the questioning route, and suspending personal views, among other strategies (see Appendix 7 for the logistic protocol).

Moreover, in order to minimize the bias produced by not asking the questions in identical ways (which affects the reliability and comparability of the findings), I was especially careful about following the wording of questions as specified in the protocol when interviewing different participants (e.g. teachers), and maintaining the same sequence when possible and assuring I did not omit questions after following up interesting responses.

To ensure the collection of high quality data from teachers, I used an existing instrument that proved to be reliable and valid. The protocol selected was the Classroom AIMS instrument, developed by Alysia Roehrig and Eric Christesen at Florida State University. The instrument was developed from analysis of a seminal series of qualitative studies, on the classroom practices of teachers who succeeded in maintaining high levels of student engagement and corresponding high levels of achievement. In general, the survey has been used to explore the differences between more and less effective teachers; to guide beginning teacher induction; and to evaluate teaching effectiveness (see Bohn, Roehrig, & Pressley, 2004; Roehrig, Bohn, Turner, & Pressley, 2008).

The AIMS instrument comprises an interview for teachers and a protocol to conduct observations, and is grounded on a framework developed to summarize three constructs

[98] This increased the comprehensiveness of the data and made data collection more systematic.
[99] Given the flexibility of the instrument, the protocol included probes to follow up on responses, and an additional set of questions on aspects of particular interest, and on topics that might be discussed during the interview.
[100] The pilot test was conducted in one of the 18 schools in the final sample.

or practices of highly engaging teachers. Specifically, the AIMS interview protocol for teachers, which is the one of interest for this research, captures data under three constructs: *atmosphere*, *instruction* and *management*, and also includes questions on student engagement.

The questions included in the *atmosphere* construct enquire about what the teacher does to the physical and interpersonal environment to get and keep students involved in learning, for example fostering a sense of community and expressing high expectations.

The *instruction* construct relates to the lessons, activities, and the teacher's instructional style, and includes questions on the use of cross-curricular connections, achievement of appropriate challenge level, modelling thinking processes, and academic monitoring, among others.

The *management* construct enquires about the rules, routines and procedures to maintain the instruction moving in an orderly fashion, and includes questions about the teacher encouragement of self-regulation, and behaviour and task monitoring. Questions on student engagement enquire about student participation, excitement and students' ability to stay on task.[101]

As mentioned before, qualitative analysis of effective teaching research lead to the development of the AIMS instrument. Although the instrument was initially developed with a focus on student engagement and reading achievement, now it is applicable across content areas. According to the authors, a first step in the design of the instrument was to compile effective teaching practices described in the qualitative studies, and develop items based on those practices. Then, the authors sorted the items, and using grounded theory analysis, developed categories and identified relationships between categories.

According to the authors, the coding process they followed started with three rounds of agreement checks, where researchers examine the original items and confirm or re-

[101] According to research conducted by the developers of the instrument, there is a significant and positive correlation between each of the three classroom practices/constructs described above and student engagement (the correlation with instruction was the highest). Significant correlations were also found between atmosphere and instruction (r=0.84) and management (r=0.62), and instruction and management (r=0.57) (Roehrig & Christesen, 2010). By no means the authors claim causality, and in fact point to the need for experimental studies that could provide evidence of the impact of teacher practices (as rated on the AIMS instrument) on student engagement as well as on achievement. In addition, research by Savage, Deault, and Burgos (2008) found that classroom-level variance in reading was well explained by the AIMS interview protocol.

categorize membership. Once item wording and category labels for categorization were agreed upon, the validity of the grouping was evaluated by having two additional reviewers independently sort the items under the group labels. After these revisions, the items entered a second round of coding, where subcategorization and wording of items were further refined. The use of the instrument to evaluate a group of teachers allowed identifying additional problematic worded items.

The process ended with the use of pretesting techniques, which include the review of the instrument by experts in early-primary grades research and expert teachers, who provided feedback on the items and their organization. Further research using Confirmatory Factor Analyses confirmed the fit of the data with the factor structures of atmosphere, instruction, management, and student engagement.

Given the rigorous design process of the instrument (and its reliability and validity), and considering that unlike other instruments examined, the AIMS instrument was in line with the theoretical framework of the research (i.e. the constructs *management*, *instruction* and *atmosphere* are in line with the constructs *classroom management*, *instructional practices*, and *teacher–student relationship*, respectively), it was selected to be implemented in the interviews with teachers.[102]

Although the questionnaire in the AIMS instrument covers sufficiently the topics of atmosphere and instruction, additional questions were included to capture data on the teachers' background and conception of student engagement. The additional questions are part of an interview protocol developed by professors Sara Dolezal, Lindsey Welsh, Michael Pressley and Melissa Vincent at the University of Notre Dame, as part of a research project aiming to investigate the practices of highly engaging 3rd-grade teachers in a sample of schools in the United States (Dolezal et al., 2003).

The final protocol for teachers includes the 19 questions of the AIMS instrument, 12 questions from the second instrument, and 15 questions developed by me, enquiring about teacher–student relationships and about trends that were evident from the analysis of the survey and that were worth further exploration. The questions are grouped in the following themes: teacher background, conceptions of learning, classroom environment,

[102] Other instruments reviewed include the Assessment of Practices in Early Elementary Classrooms (APEEC) and the Weller's Teacher Performance Assessment Instrument (TPAI).

home–school connections, understanding of student engagement, atmosphere, instructional practices, classroom management, and teacher–student relationship (see Appendix 8 for the instrument).

Contrary to the protocol for teacher, the instruments used to conduct the interviews with principals and students were self-developed. I decided to use self-developed instruments (despite the possible threats to validity), as it was not possible to find an instrument to collect data from students and principals that shared the conceptual framework of the protocol used to collect data from teachers.[103] In addition, by using a self-developed instrument I avoided asking students questions about their teachers and their practices, and instead was able to conduct more open questioning, letting the students tell in their own voices about their perspectives on what they thought was engaging or not about their lessons, and about their perspectives towards schooling and experiences in the school. In the section devoted to the adaptation of the protocol to the Mexican context, I explain how the concerns about validity and reliability were approached.

The interview protocol for students contains 23 questions, grouped into three themes: students' perspectives towards schooling, student–teacher relationship, and experiences in school. It also includes questions derived from the survey, aimed to explore further common or interesting responses (see Appendix 9 for the interview to students). The protocol for the principal contains 13 questions, and focuses on exploring the principal's perceptions of the practices of the 6th-grade teacher who might be promoting student engagement. This protocol also includes some questions on school programmes, initiatives and other factors that might be crucial for engagement according to the principal (see Appendix 10 for the interview to principals).

Adaptation of the protocol to the Mexican context

Once I translated the questions from the AIMS instrument into Spanish, pretesting techniques were conducted in the three instruments in order to uncover contextual factors that could decrease the quality of the responses. Specifically, a primary school teacher with 30 years of experience working in public schools in Hidalgo as a teacher and as a technical pedagogical advisor, and who also collaborated in the design of the National

[103] The threats to validity include problems related with the wording of the questions, ambiguity, misspecification of the concepts and content of preceding questions influencing respondent's interpretation of later questions, among others.

Programme for Primary Education for the year 2004, reviewed the questionnaires to ensure they were culturally sensitive.

In general, the expert identified problems related to wording of questions and suggested specific changes to adapt the questions to the level of knowledge of a 6th-grader in rural Mexico, and provided advice on the combination of questions that formed a theme, and on the order of the questions. She also advised on including a question in the three instruments asking participants to add information not cover during the interview, and helped refine the questions enquiring about the student–teacher relationship in the protocol for teachers.

The expert also contributed to the development of probes and pointed out all the programmes that were in place in that moment at the primary public schools in the state, which was extremely useful for refining the protocol for the principals. Finally, she advised on how the framework of some of the questions could be aligned with the current government guidelines for basic education.

In addition, a pilot test was conducted in one of the 18 schools in the final sample. Thanks to this exercise, it was possible to identify that the teachers' instrument was very long and what questions could be dropped. It was also evident that the interview with the students should not last longer than an hour, as students got distracted, and the quality of the responses decreases greatly after that time. The field test did not reveal lexical, semantic or pragmatic problems in the questions.

Application of the interviews

Once consent from the principals was obtained, I interviewed in Spanish a total of 23 students in school AI2440 and 11 students in school CO8304, as well as their respective teachers and principals. The 6th-grade teacher in both schools was asked to form groups of five students. Each group had a leader, all members work well together and like each other (according to their teacher), and they all perform at different achievement levels.[104]

In school AI2440 three groups of six students and one group of five students were formed, and in school CO8304 one group of six students, and one group of five students were

[104] Grouping students by affinity was an effective strategy, as the majority of students appeared to be relaxed and were confident sharing their opinions in front of the other members of the group.

formed. Each group was interviewed for one hour on three different occasions. In school AI2440 the interviews with students took place in a room next to the principal's office, which offered privacy and a quiet environment. In school CO8304 the interviews were conducted in the computer laboratory (in disuse at the time).[105] All students were seated in circles, facing each other and I placed name cards on the table in front of them to help me remember student names during the first session (see Appendix 11 for a photo of the seating arrangements). The decision about the best time to conduct the interviews with students was left to the teacher. The interviews were always held during class time, while the rest of the students in the classroom attended a full class session with the teacher.

There was full attendance of the students in school CO8304 during the six sessions. In school AI2440 there were a total of five students absent during the 12 sessions. During the first session, I gave the students as an incentive, an identical bag of candies (with previous authorization of the principal and the teacher) with individualized stickers thanking them for their participation (see Appendix 12 for a photo of the incentive).[106]

The discipline during the interviews was good, except for the behaviour of the few girls who made fun of some of the boys while they were answering, and pressured them to provide more information. Another concern arose from the fact that some of the students were extremely shy and therefore struggled to participate fully during the first session (see section on 'Ethical considerations' for further detail).

There was a total of three sessions with each teacher, and every session lasted approximately two hours. The sessions with the teachers in both schools took place at the end of a school day. In school CO8304 the sessions were held in the principal's office (as the teacher was also the principal) and in school AI2440 at the 6th-grade classroom.

Both principals suggested the best time to conduct the interview was during a weekend; therefore, these interviews took place on a Saturday morning. Although the questionnaire for the principal was designed to last one hour and be conducted in one session, both

[105] In both schools, students were comfortable during the session, as they were seated sharing a table or at individual desks.

[106] Although the Ethical Guidelines for Education Research that I followed explicitly advised against the use of sweets as an incentive to school-children, I decided to use candies to encourage participation as students in these schools rarely have the opportunity to eat sweets, and because I heard from the principal in one of the schools that student were taking the breakfast provided by the school to their homes so they could share the food with their siblings, and I assumed this will be the case with the candies, and therefore it will not have undesirable effects on their health.

principals devoted approximately four hours to the interview, as they spontaneously offered to share additional information about the school resources, collective responsibilities, public support and characteristics of the community, among others. These additional insights were incredibly useful to understand contextual factors promoting student engagement.

I arrived in advance to the sessions to follow a logistic protocol, which included procedures such as watch for factors that could interfere with the session (e.g. noise or open windows), make a sketch of the seating arrangement, and create a comfortable environment. Once the participants arrived I followed a template that include an introduction,[107] and the procedures to follow during and after the session, such as checking the recorder was working properly and taking handwritten notes on responses and attitudes (see Appendix 7 for the protocol).

The decision about the day to conduct the interviews was left to principals and teachers (see Appendix 6 for the schedule of the fieldwork). As a result of this flexibility, the interview process was successful in both schools, with minor changes to the original schedule.

In addition to the interviews, the principals in both schools invited me to participate in numerous school activities. For this reason, I was able to attend technical councils and activities such as the weekly collective reading aloud sessions, the celebration of Mothers' Day, extracurricular activities, and breakfast time, a particularly useful experience, as all staff members sit as a family every day to share the meal and have thoughtful discussions about daily problems and anecdotes at the school. These experiences were also important to increase my understanding of factors outside the classroom that promote student engagement.

[107] The introduction included explaining the purpose of the session, establishing the rules, assuring confidentiality and letting participants know the session would be recorded, among others. During the first session with the students a discussion about the meaning of confidentiality was held. I explained the only purpose of recording the interview was to avoid missing any of the valuable information they were sharing with me, and that only I would be hearing the recording.

Characteristics of the data collected

As a result of the interviews I had 45 hours of recording in Spanish. To be able to conduct the analysis, I transformed voice files into text, using the speech recognition software, Nuance Dragon. Once all interviews were in text in Spanish, I planned to translate them into English, however I soon realized this was impractical since it would take a great amount of time, without adding value to my understanding of the interviews, as I had already immersed myself in the data when transforming the voice files into text.[108] Moreover, the conversations were conducted in colloquial Spanish, making it difficult to preserve the original meaning of cultural expressions in the translation, which posed a threat to the validity of the data.[109]

In addition to data from interviews, I collected data in the form of descriptive notes (which contained portraits of participants and descriptions of the physical setting), accounts of the school visits (e.g. particular events and activities, stories shared by the teachers on our way to the school, observations from a lesson to a special education student, interactions between staff members and students, visits of the school supervisor to the school, etc.), and reflective notes, where I registered personal thoughts, such as speculations and impressions.[110]

Data analysis

The data analysis was guided by the Miles and Huberman (1994) model of thematic analysis. According to the authors, data analysis should be directed at tracing out lawful and stable relationships among social phenomena, and consists of three components. These components (which interact through the analysis) are: data reduction (i.e. editing, segmenting, summarizing, coding, memoing, and all other activities that allow the researcher to find themes, clusters and patterns); data display (i.e. organize, compress and assemble data and present it using tables, graphs, diagrams, etc.); and drawing and

[108] This was the case, as I had to read aloud the interviews for the software to transform my voice into text.
[109] A translator of Spanish–English was hired to translate the quotes included in the results section. I spoke with the translator beforehand to familiarize her with the purpose of the research, and engaged in discussions with her throughout the research process about word choices and translation possibilities to achieve conceptual equivalence. Once the translation was ready I cross-checked it to ensure all cultural expressions and key terms preserved the original meaning.
[110] This data resulted mainly from daily entries to a diary a kept during the fieldwork.

verifying conclusions (these processes start forming vaguely during the data reduction stage and are sharpened when all data has been analysed).

Following this approach, once raw data from interviews was converted to text and the field notes were reviewed in detail, I conducted data reduction using the software Nvivo. As mentioned before, the objective of the analysis was to understand how the practices included in the econometric model were materialized at the classroom level and how they translate into higher levels of engagement. In order to achieve this objective, deductive analysis was conducted using as nodes the practices/constructs included in the student survey (and more specifically the items within the survey).

However, as the analysis also aimed to identify practices not included in the model (as well as individual characteristics and contextual factors) that could be promoting student engagement in the schools, inductive analysis was also adopted to identify themes emerging from the data, which were not anticipated at the beginning of the study. Recurrent issues in the data emerging from inductive analysis lead me to uncover the importance of factors such as the existence of a professional learning community or the availability of resources, which were difficult to recognize during the first stage of the research, given its focus on the classroom.

An important exercise during the analysis was the process of memoing, as it enabled me to integrate into the analysis the descriptive and reflective notes captured during the fieldwork. Specifically, I was able to link records of research events (i.e. impressions and informal observations) with interview data for subsequent interpretations and further investigation. In addition, by using memos I was able to integrate into the analysis my growing understanding of the phenomena, for example by documenting contradictions or similarities in the accounts of different participants within the same school.

The data was examined using a within-case analysis method, where data from each school was analysed (and presented) separately, as opposed to a comparative method, where the similarities and discrepancies across schools are at the centre of the analysis. The decision to use a within-case analysis method was made after thoughtful consideration of the schools' characteristics. Specifically, it was considered that the differences in terms of resources and structure between schools were so prominent and the dynamics of each

school so unique, that the discussion would be enriched by presenting the promoters of student engagement as the result of a particular context.[111]

In order to test for *validity*, I used triangulation of methods (i.e. survey and interviews) and sources (students, teacher and principals) to seek similarities as well as convergences in the data. For instance, I validated the students' responses from the survey about teacher practices, with teacher responses on the same topic. As can be seen in the next section, I also provided rich descriptions of the findings and clarify the sources of bias that were brought to the study.

To check for *reliability*, I documented in detail the procedures used to obtain the data from the case studies, to ensure other researchers are able to replicate the analysis. Also, a friend with experience on qualitative research conducted agreement checks to verify the validity of the coding, which allowed me to determine how accurately another person could recreate my coding. Once he was provided with the list of nodes and sub-nodes and their description, he was asked to sort a sample from the interviews into the predetermined nodes and sub-nodes. For the sample, his placement of text into the nodes was aligned with the original code placements.

SECTION II – Results: School AI2440

This section presents the perspectives and practices of teachers in school AI2440 that promote and challenge student engagement. The section starts with a description of the school's characteristics. Later, a first approach to the data is made by presenting a summary of the teacher's responses to the questions concerning *who is a good student*, *how students learn*, and *who is an engaged student*. It is considered that the answers to these questions are crucial to inform the onward analysis given that they help to understand why the teacher uses certain approaches to engage students and what the teacher is trying to achieve with his practices.

Later, common themes among the interviews with the teacher, the principal and the students are presented. The results are grouped in findings related to the enablement and the challenges for achieving student engagement, and differentiate whether they occur at

[111] These differences lay in the fact that some of the schools have for example a multi-grade scheme while others operate under a complete organization scheme, or that some of the schools have a library and a computer laboratory while others lack these facilities.

the classroom, school or household level. The section concludes with a summary of the findings for the school.

School characteristics

School AI2440 is part of the full-time programme and has a fully equipped library, cafeteria and a functioning computer laboratory with 23 computers (i.e. one for each student in a classroom). The school has a complete organization scheme, which implies that it has a full-time head teacher and one teacher in each grade level. Moreover, the school has an English, a Physical Education, and an IT teacher as well as a full-time librarian, administrative staff, and access to the Regular Education Support Service Unit (USAER).[112] There is a total of 23 pupils in the 6th-grade classroom and 127 students across the school. The 6th-grade teacher has six years of experience and has a *Licensure* degree, while the head teacher has 22 years of experience. Finally, the school is the least rural school in the sample, as it is located 4.9 kilometres from the capital of the state.

Teachers' views on learning and engagement

The teacher's accounts revealed that he considers a *good student* one who *participates*, has an *inquisitive mind*, *enjoys being at the school*, and has *moral values*. The following comment captures his reflections in this regard:

> A good student is one that has good disposition, who wants to come to the school to learn, to create, to express his views, to participate, to interact, to have fun … the school does not have to be something rigid … A student who is enthusiastic, who has strong moral values … look, *my students are always*, *always asking things*, they are asking about how things happen … why things happen, that for me, is to be a good student … I could have said that a good student is a student who scores 10, who does not say a word, but that is not what I want, I want students to participate (…) to ask questions all the time.

When asked about how students learn, the teacher asserted that students have different learning styles, which include 'kinaesthetic, tactile, auditory, and visual'. Illustrating his understanding, the teacher provided examples of the learning styles among his students:

> Each student has a completely different learning style … they learn in every moment; sometimes I feel they are not paying attention when in fact they have already grasped the idea … they learn in different ways, some of them learn

[112] This Unit is composed of a multidisciplinary team that includes special education teachers, a social worker, a psychologist and a speech therapist.

> through direct interaction with material, others by listening, others through observation … they have many learning styles that range from memorizing, manipulating, experimenting, playing … for some of them listening 10 minutes is more than enough, but others need to manipulate, some have to see it, some have to be in front of it and some others need to repeat it again and again.

With the aim of letting the teacher reflect on his own understanding of engagement, he was later asked about how he realizes that a student is engaged. His accounts indicate that he conceives student engagement as having a behavioural (being responsible and participating) and a cognitive component (willingness to go beyond the requirements). Describing his thoughts, the teacher asserted:

> When we assign research the most engaged students do not limit to a single source of information, instead they go to Internet, they bring a poster, they bring the biography of the person we are learning about … The commitment is also accompanied by responsibility and it comes from a personal level, in the presentation of their notebooks, the attendance, the dedication to the tasks we assign them.

Furthermore, the teacher emphasized that engagement stems from students liking the subject and from the students having a 'research spirit'. As part of his reflection, the teacher introduced for the first time in the interview the idea that the efforts to facilitate engagement were not individual. He mentioned that these efforts were in fact part of a collective approach to student learning, and were replicated by all teachers in the school.

Enablers and challenges to student engagement

The following section presents the findings from the interviews. The results are grouped as findings at the classroom level and at the school level. At the classroom level, it was found that the enabling factors for student engagement were: *the teacher's practices*, *the classroom activities*, *the teacher's attitudes*, and *the fact that parents were involved and placed high value on education*. In terms of challenges, the key factors that emerged from the data were *the implementation of individualized and repetitive routines* and *the difficult socioeconomic background of the students*.

The findings revealed that at the school level the enabling factors for student engagement were: *the principal's support for academic achievement*, *the existence of a professional learning community*, and *the innovative generation and use of school resources*.

Enablers for engagement at the classroom and individual level

As mentioned at the beginning of the chapter, the first aim of the analysis was to understand how the practices included in the econometric model were materialized at the classroom level and how they translated into higher levels of engagement. To achieve this objective, I conducted deductive analysis using as nodes, the practices/constructs included in the student survey (and more specifically the items within the survey) when analysing data from the interviews to the teacher, the principal and the students.[113]

As a result of the analysis some of the practices included in the model appeared to be enablers of student engagement, while others were not found to be relevant to the interviewees. [114] Thus, the following section summarizes the practices commonly suggested by the participants as promoters of student engagement.

1. TEACHER PRACTICES

1.1 Academic Personalism

Academic personalism is defined in the survey to students as the extent to which the teacher connects with students in the classroom and supports them in achieving academic goals. The interviews to teacher and students revealed that three of the five items included in this construct appeared as promoters of students' engagement: 'my teacher notices if I have trouble learning something', 'my teacher is willing to give extra help on schoolwork if I need it', and 'my teacher helps me catch up if I am behind'.[115]

1.1.1 My teacher notices if I have trouble learning something

Interviews with participants revealed that the teacher deliberately uses a set of strategies that help him notice when a student struggles to learn the course material. Specifically, the teacher *identifies from the beginning of the year students who may have difficulties in the future*, *encourages all students to ask questions*, *has a positive attitude towards mistakes*, and *monitors understanding individually*. According to the teacher, when

[113] The practices include: academic personalism, academic press, clarity, discipline, trust and rigour.
[114] For instance, the practice *academic personalism* includes five items but only three of them appeared to be relevant as a result of the analysis.
[115] The other two items included in the construct are: 'my teacher gives me specific suggestions about how I can improve my work in class' and 'my teacher explains things in a different way if I don't understand something in class'.

students receive this support, they increase their willingness to participate and exert effort in the classroom activities.

In order to *identify students who may have difficulties understanding the course material in the future*, the teacher implements an evaluation at the beginning of the year that helps him assess the overall achievement level of his new students and identify their learning needs. The instrument used by the teacher puts together a diagnostic tool suggested by the SEP, the desired exit profile for 6th-grade students, an assessment of the students learning styles, and in the case of language, an evaluation on reading comprehension and fluency.

The results of this diagnostic are coupled with regular observations that the 6th-grade teachers conduct at the classroom level one year before the students arrive to his classroom, that is, when they are 5th-grade students. As a result of the diagnostic, the observations and a constant communication with the 5th-grade teacher, the 6th-grade teacher has a better understanding of the profile of his new students and their learning struggles.

In addition to these efforts, the teacher receives assistance from the USAER to identify students with special needs, and students who may struggle in their learning process. In order to identify the students, the USAER conducts a psychopedagogical evaluation using the student's history, his/her educational experience, and work samples. Once the students have been identified, the USAER collaborates with the teacher designing curricular adjustments and activities for these students, and supports him in managing the inclusion of the pupils in the regular activities of the classroom. The information provided by the USAER not only helps the teacher to anticipate which students will be more likely to have difficulties in their learning process, but also prepares him to work with them.

As a result of these efforts, at the beginning of the academic year, the teacher had identified *six students* (including two students with special needs) that struggled very early with learning the course material, and onwards he paid special attention to their understanding of specific subject areas.

The teacher's accounts indicated that he is equally concerned with the learning process of the rest of the students. His strategy in this regard is to continuously encourage student to ask questions. Regarding the willingness of the students to actually ask questions when

they do not understand, most students agree that they were willing to do so due to the *positive attitude of the teacher*: 'I ask questions because I feel the teacher is like a friend to me (…) he is always present with us, if we have questions he helps us'.

This contrasted with a small group of students who did not feel comfortable asking questions because they were afraid some of their classmates would make fun of them. Illustrating this point, Mario stressed that he is ashamed to ask questions because 'sometimes the clique make fun of us'. On the same line of thought Carla commented: 'I am ashamed to raise my hand because I feel that if I say something, the clique that always gets together will say something to make it seem like I am wrong.[116]

1.1.2 My teacher is willing to give extra help on schoolwork if I need it

Data from interviews revealed the teachers' emphasis on providing personalized instruction to students who are experiencing difficulties in specific subject areas. This support is materialized at the classroom level thanks to the teacher's willingness to *spend extra time with students who need help*, *plan and provide remedial activities where he explains concepts in more details and make activities fun*, *provide students with extra opportunities to succeed*, and *measure students' progress and communicate that progress to students so they can relate effort with improvement*. The teacher's accounts indicate that these practices do not imply pressuring students but instead motivate them.

The willingness of the teacher to spend *extra time with struggling students* was evident in the teacher's response regarding the support he provides to the learning process of the students. His approach is captured in the following reflection regarding his work with his 'six cases':

> I'm always careful with my six cases. 'Did you understand Andres? More or less teacher.' That 'more or less' means *we are going to work in a while* and they already know it … even their moms, when they come for them, they are aware they will spend time working with me after the school day is over … as I told you, there are mentoring and monitoring actions … we have this monitoring since the first two months … we are working with them since the diagnosis where we detected them.

[116] The term *clique* denotes a group of people who interact with each other more intensively than with other peers in the same classroom. This social group excludes others on the basis of superficial differences.

This support is materialized at the classroom level when the *teacher implements remedial activities* suggested by the USAER (in the case of the students with learning difficulties) or designed by him (in the case of the rest of the students) and are focused most of the time on reading comprehension and literacy.[117]

The activities can be performed individually during class-time but are more often conducted in groups when the rest of the students are attending computer class or a session in the library. As illustrated in the following comment, *during these remedial activities the topics are explained in greater detail and the teacher makes activities fun*:

> Pablo: On Wednesday the teacher gave us exercises during the Mathematics class, divisions … and for those who will probably fail, he asked us to wait for him, the others went to the library and the teacher explained us how to divide, the multiples and we played the game the *poisonous number* and the activities were fun.

The teacher also highlighted the importance of *providing students with additional opportunities* to succeed, and to *evaluate their progress* so they understand improvement is possible if they exert effort. Illustrating these practices, the teacher asserted:

> Manuel was very reluctant to read, and I said, 'Let's throw ourselves into it!', 'You didn't understand? Come on let's read' … and we start working with him … I recorded his reading exams and told him, 'Listen to how you read', and he said 'Yes teacher you're right' (…) here let me mention that from my six cases, Manuel is improving, I have five left.

Asking Manuel about the activities that help him learn, he mentioned that he valued the opportunities presented by the teacher to improve his skills:

> Readings is what helps me, for instance, every two months the teacher takes us to reading time, at the beginning I read badly, I spelled a lot and then he made us a test two months later and I did ok, and on the following test I did well (and what did he make so you will improve?) … Reading and writing … he asks us to read and the next day to tell him about it, or to write cartoons.

1.1.3 My teacher helps me catch up if I am behind

Although the support to struggling students is a salient characteristic of the teacher's practices, this support is not confined to this group of students. In fact, the vast majority of the students were emphatic, affirming that the teacher devoted a great deal of effort ensuring that all students understand the material taught. Specifically, the accounts

[117] As will be evident later, the fact that the teacher focuses on reading comprehension and literacy is the result of an agreement at the school level to put Language at the centre of the learning process.

suggest that the teacher *is willing to explain a lesson as many times as needed*, *remains patient while explaining the course material even after several explanations on the same topic*, *cares about student learning*, and *has a positive personal disposition and resilience towards the setbacks he faces in the classroom*.

The students were not short on examples to illustrate the idea that the teacher was *willing to explain a lesson as many times as needed*. A quote from Maria's interview summarizes the students' thoughts in this regard: 'when we don't fully understand a subject, he explains it to us and if we still do not understand he explains it again, he explains as many times as we need to understand him well.'

When asked about how this individualized support operates during class-time, the teacher explained:

> I first explain the material, then I allow 15 minutes for the students to develop a first activity, if they don't understand I assign another activity and I stick to students who did not understand the first time and we work together (…) but it is not about solving their task or saying it is done like this or that, it's "let's read it", it's about "Hey! What procedure would you use? Does it relate to such or such?"… Sometimes I put the ones who did not understand in a group, we make other examples, I try to adapt the explanation to their learning level.

The students also suggested *the teacher remained patient* while providing this support. Illustrating this idea, Pablo commented:

> What helps me to understand (Mathematics) is the way he explains, his patience with me (How is that?). He is friendly when he explains, he is very patient with some of my classmates, for example if we do not understand something, we go and ask for his help and the teacher explains and if we don't understand, he repeats without getting angry.

In addition to the teacher's willingness to explain a lesson, all the students pointed out that *the teacher cared about their understanding of the subjects*. The students explained that this was the case as *the teacher did not start a new topic until everyone has understood*, *always provided support when students failed to attend a class*, *was available after school time to continue providing support* (through mail, texts and social media), and *was willing to spend extra time at the end of a class or the school day to clarify concepts taught during the day*.

Reflecting on the last practice, Isabel commented: 'We are the last to leave because when he finishes everything, when he tells us to gather our things, he starts saying "I saw that

you did not understand" and "what is your difficulty" … those who understood can leave, and those who didn't stay for a new explanation.'

Although the support provided by the teacher was evident from the participants' accounts, one student also pointed out that there was a limit to these tireless efforts. When asked if she thought the teacher was not happy until every student had understood, Diana commented: 'more or less, because sometimes he explains like five times and some classmates hardly understand him because they are just playing and so on, the teacher tells them he won't explain again, that when they really want his help they go to his desk and really ask for help.'

In this regard, the teacher made a crucial comment by pointing out the importance of teachers having a *positive personal disposition and resilience* when faced with difficulties in the classroom or dealing with frustration. Illustrating this point, the teacher asserted:

> Optimism is required to work with them (optimism in what sense?). Look, students are very diverse, you see, some understand one thing quickly, but sometimes you make an effort in a class and the next day they forget … So ok, you have to say, we will back to it, no problem, we are going to provide feedback.

According to the teacher, this extended personal care and individualized support are important for student engagement. He suggests that providing students with ample personal support contributes to improve student motivation and confidence on their ability to master content. He suggested that providing academic personalism seems to be especially important for students with poor academic skills, who can benefit the most from having a realistic chance of responding successfully to high expectations.

In addition to the personalized support provided by the teacher, the array of supplemental academic and social services offered by the USAER also supports the students' efforts. According to the teacher, by addressing problems such as having learning difficulties, special needs or extraordinary adverse home circumstances, the USAER is in fact improving the ability of the students to reach the same academic levels as their peers and succeed in school. In addition, the accounts suggest that the support provided by the USAER improves the effectiveness of the teacher as in the absence of this strong organizational support, the teacher will need to solve the students' difficulties on his own, probably with less knowledge about the specific problem faced by the student.

1.2 Trust

Trust is defined in the survey to students as the extent to which students and teachers share a high level of mutual trust and respect. Following the same logic described above, I conducted deductive analysis by including *trust* as a core node at the beginning of the analysis to capture data referring to the items in the construct. However, these items were not sufficient to capture all the dynamics of *mutual trust and respect* mentioned in the interviews, and therefore new topics emerged from the data.

Specifically, two of the items included in the construct *trust* in the survey were found to be relevant for the participants: 'my teacher treats me with respect', and 'my teacher will always listen to students' ideas.[118] In addition, five new topics emerged from the data: 'my teacher cares about me', 'my teacher takes the time to get to know me', 'my teacher is my friend', 'my teacher promotes good relationships', and 'my teacher motivates me'. The following section develops each of these seven practices.

1.2.1 My teacher treats me with respect and always listens to my ideas

All students agreed the teacher treats them with respect. In fact, some of the students referred to the teacher being respectful as his best attribute (they also mentioned the respect was reciprocal). Specifically, the students' accounts revealed that they associated the idea of the teacher treating them with respect, with the fact that *the teacher treats them as equal; treats them with decency; and always listens to them*. Interestingly, some students commented that the reason why the teacher treats them with respect is to motivate them and help them to look forward to going to school every day.

This comment made by Julio summarizes the students' thoughts on the idea of *decent treatment*:

> The teacher has never disrespected us, he always speaks to us calling us by our names, or as son or friend, or Julio, and he has always respected us, and when he gets angry he does not say anything bad, he scolds us, but he has never told us, you're good for nothing, or fool, he has always supported us (…) and he has always respected us and we also respect him.

[118] The other items in the survey included: 'when my teacher tells me not to do something I know he has a good reason', 'I feel safe and comfortable with my teachers at this school', and 'my teacher always keeps their promises'.

Reflecting on the importance of being kind with the students, the teacher asserted:

> They are not wrong, that would be labelling them, 'you are wrong', or 'what you say is wrong!' … that hurts and makes them not want to *participate* later … instead when you respect their processes and when you say 'Ok! but you can do it this way', when comments come up as recommendations it is like they take it in a more confident way.[119]

1.2.2 My teacher cares about me

The students' accounts revealed the support provided by the teacher to *promote their emotional wellbeing*. The students were not short on examples to describe the discussions they have with the teacher on children's rights, domestic abuse, teenage pregnancy, bullying, and depression, among others. The students also mentioned the teacher helps them deal with feelings such as anger and sadness.

In addition, *the physical wellbeing of the students* is a cause of concern for the teacher, more specifically the malnutrition of some of them. Five students commented on the support provided by the teacher in this regard. For instance, Rosa asserted:

> the teacher worries about us because when we are hungry he gives us breakfast or even he asks Paola (the lady who sells in the cooperative) to sell to us on credit so we can eat something, or he gives us money to buy … Julio: and he does not even charge us later.

The teacher's account also revealed that he provides parents with information that helps them to take better care of their children. For instance, he discusses with them the importance of providing children with breakfasts and proper meals during the day, and how to protect their children in unsafe environments like the ones they are continually exposed to (e.g. how to prevent child abduction, a common crime in the state), among others. Finally, the teacher commented he spends a considerable amount of time making sure students have valuable information to stay safe while using the Internet.

1.2.3 My teacher takes the time to get to know me

In a similar vein, the teacher spoke about the importance of *understanding the background his students bring to the classroom*. Specifically, the teacher mentioned he

[119] This reflection is particularly important because it summarizes how, by having a positive student–teacher relationship the teacher is able to encourage students' participation and therefore promote the behavioural engagement of his students.

implements a socioeconomic survey at the beginning of the year and spends time getting to know the students. However, he stressed this is a process that takes the entire academic year and that it is not the result of simply asking the students about their parents' jobs or the place where they live. Instead, he suggests it is the result of noticing aspects in daily routines such as who always has breakfast and who does not, or who is often in low spirits.

The teacher interview revealed that he is well informed about the students' home environments and most importantly that he draws on such background knowledge to (i) construct profiles for each student, (ii) guide students in their particular struggles, and (iii) to understand and deal with disciplinary problems. An example of the type of information the teacher finds useful is provided below:

> I found out that Santiago's dad was not here, he was working in the US, which is very common in this community (…) then, coincidentally at the beginning of 6th grade the father arrived, he even came and enrolled Santiago in the school right before the beginning of the classes, and I have to tell you there was an immediate change in his behaviour, from what I saw in 5th grade to what I saw in 6th grade, now he collaborates with his classmates, he is very respectful.

The students' accounts corroborate the idea that the teacher uses daily routines and conversations in the classroom to get to know them well. For instance, Santiago commented that when they return from vacations the teacher asks them what they did during vacation time, with whom they spend the vacations, and if they visited new places, among others. Similarly, the students were not short on examples to explain that the teacher notices when they have troubles at home and therefore cannot concentrate in school. In this regard, Carla commented: 'What I like the most about the teacher is that he talks with us when we have problems at home, he notices.'

1.2.4 My teacher is my friend

Although the evidence presented above suggests the existence of a caring and supportive relationship, the accounts indicate that the interest of the teacher in the wellbeing of his students is much more profound. In fact, the teacher indicated that his students were like younger siblings to him and *almost like part of his family*. For instance, when enquired about his motivation to go to work every day, the teacher asserted that it was the opportunity to share time with the students. The teacher also commented that his aim was to be *connected to students at the emotional level*. Students' enthusiastic responses in this

regard indicated that the teacher has achieved this goal, as the vast majority refer to him as a dad, as an uncle, or as a friend.

In order to have a deeper understanding of students' thinking, they were asked to reflect on the reasons why they consider they have a close relationship with the teacher. The students commented that *the teacher had a particular and affectionate way of treating them*. For instance, Santiago asserted: 'he calls me Chari (this is how they call me at home), he says: hurry up Chari or you won't go out to recess (…) we are almost like friends.' Similarly, Jairo commented, 'he doesn't call us children, he calls us son, he doesn't treat us as simple students, he treats us as if we were his sons.'

In addition, the vast majority of *students described the teacher as a trustworthy individual*, and emphasized the fact that he always helps them, no matter what they do. Illustrating these points, Isabel commented:

> What I like about the teacher is that more than a teacher we can count him as if he were a friend, because sometimes when we finish (the school day) we talk to him as if we were friends, he would help us if we have any problem, we trust him a lot in case we have any problem with some school subject or so.

The principal highlighted the importance of the good relationship between the teacher and the students. Specifically, when asked about why she thought the 6th-graders had reported being engaged, she did not hesitate to suggest it was the result of the good relationship between the teacher and the students. The following reflection helps to elucidate her view:

> You know what I feel? That children love their teacher, they commit with him because *they find in that teacher (...) the friend who listens, the friend who always creates a healthy environment of respect, who helps them take care of their things, who gives them a clean and organized classroom, who publishes their work (...) he makes them feel important*, all this helps the child to feel comfortable in the classroom and in the school (…) Diego loves talking to students, respects the individuality of children (…) he is a very peaceful person and yet he handles kids very well. Working with children from 6th grade from any school is very difficult (…) and the fact that Diego hasn't lost control, discipline and respect is great. His students love him! He has known how to connect with them.

1.2.5 My teacher promotes good relationships among students

In addition to the evidence suggesting that the teacher has a close relationship with the students, the accounts indicate that he also promotes warm and harmonious interactions

between them. This finding seems to be in line with the teacher's accounts suggesting that teaching *values* to the students was one of his top priorities, and with the school motto *education with values* which promotes the creation of a learning environment that not only enhances academic achievement but which also develops students' social skills.

The participants' accounts indicate that in order to promote good relationships between students, the teacher *uses the civic and ethics class as a platform to solve problems between students*,[120] *promotes a positive and emotionally safe classroom environment where students treat each other as family*, *involves the parents in the development of the social skills of the students*, and *helps students to act assertively and with empathy*.[121]

1.2.6 My teacher motivates me

The vast majority of the students suggested they receive continuous motivation from the teacher. The participants' accounts revealed that the motivation provided by the teacher is materialized when *the teacher uses the particular interests of the students to engage them in the tasks*, *encourages them when they are tired, bored or have failed at a given task*, *promotes their self-efficacy*, and *makes students think about the future and how they will reach their goals*.[122]

Reflecting on this topic, the teacher commented:

> I come to fill a figure that they do not have at home, someone who tells them "you can" … instead of scolding, "make an effort", "let's go", I feel that this is a very important part that they didn't know … it is not about being severe, it is more "come on, you can", and they like that.

Reflecting on the motivation provided by the teacher the students asserted:

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[120] In this class students learn about the values, virtues and ethics that help them to build their character and morality. In addition, they receive instruction on the practical aspects of citizenship, including their rights and duties. The instruction in this class is delivered by the teacher using as a core a story collection provided and suggested by the SEP called 'Kipatla: to treat us equally'. The collection includes a manual for teachers and parents, and books and videos aimed at children, addressing the subjects of equity and non-discrimination. Reflecting on the effectiveness of this approach, the teacher asserted that the class helped him especially with problematic students. Although the students did not suggest that the positive change in attitude of some of their peers was the result of the Ethics and Civic Class, several students commented that the conflicts among students were reduced by the end of the academic year.

[121] Although 19 of the 23 students agree with the idea that there is an emotionally safe classroom environment, a group of students was emphatic in affirming that despite the teacher's efforts they did not have a good relationship with all the students in the classroom.

[122] Encouraging pupils to think about their future was particularly important for the teacher as some of them, and particularly the boys, indicated they were considering having occupations that require no more than a high school diploma.

> Adriana: He always tells us to make an effort and to never stay behind or give up, he says that we are going to be grown ups and with our career we are going to have a decent job, a house of our own.
>
> Isabel: He tells us that he believes in us, that he sees in each one of us a professional. (What advice does he give you?) That we can improve if we study, read, that with effort we can do everything.

In sum, the results revealed that the quality of the relationship between the teacher and the students was the key factor influencing emotional engagement. Specifically, the accounts suggested that the climate of respect and harmony, the decent treatment, the perception that they were being protected and cared for and the family-like relationship with their peers and the teacher, ultimately make them feel that they are significant members of the classroom and that they belong to such community.

1.3 Clarity

Clarity is defined in the survey as the extent to which the students are provided with clear learning goals and instruction that support achievement.[123] From the five items included in this construct, only the following appeared as relevant in the analysis:

1.3.1 It is clear to me what I need to do to get a good grade

The teacher identified the *use of rubrics* as the most important practice to provide clear learning goals to his students. In fact, he mentioned the use of rubrics as a way to engage students in the classroom activities.[124] When enquired about this practice the teacher asserted:

> The rubrics are very detailed instructions that I give them in every task or project (…) the rubrics tell them what the project should contain if they want a score of 7, what it should contain if they want a rate 10 … for example … a few days ago we had a letter of opinion and the rubric indicated that the letter should be dated, have greeting, formal entry, recommendations, etc. and that it should be developed in a coherent way, have good spelling, punctuation marks, margins … the substance and form.

[123] The items included in this construct are: 'the homework assignments help me to learn the course material', 'I know what my teacher wants me to learn in this class', 'it is clear to me what I need to do to get a good grade', 'I learn a lot from feedback on my work', and 'the work we do in class is a good preparation for the test'.

[124] Similarly to a previous comment where the teacher suggested the efforts to facilitate engagement were part of a school strategy, he pointed out that the use of rubrics was not a personal initiative but instead a practice developed and adopted by the teachers two years ago.

Although the topic of rubrics was not recurrent in the students' accounts, as the majority of them when reflecting on 'how to obtain good grades' focused on aspects such as 'studying the notes' or 'coming to school', the students' comments indicate the common use of rubrics. For instance, Jairo explained:

> when we start a new topic, he gives us the name of the topic, he gives us the steps or tells us how we are going to do it and how the result must be at the end … there are times when he gives us sub-topics and tells us the objectives, he always tells us what he expects from us.

1.4 Discipline

The participants' accounts suggest that an effective classroom management strategy is in place in the classroom. For instance, in response to the question, 'what do you like about your teacher?' some of the students commented they like that the teacher has 'everything under control'. When asked to explain further, one of the students commented: 'he has it under control if we make a fuss, if we are talking, if we are standing, for instance if we are out of our place he tells us to stand up and keep writing like that (i.e. standing).'[125]

Analysis of the interviews with participants suggests the teacher uses five practices to maintain an adequate classroom management. These practices are: *involving students in the development of classroom activities*, *monitoring the students constantly (especially those with disruptive behaviour)*, *having clear consequences for misconduct*, *involving students in the setting of the classroom rules*, and *including student behaviour as a criterion for course grading*.

The principal also supports the teacher's efforts to maintain discipline at the classroom level. Her accounts revealed that she is highly interested in understanding the reasons for a student to be constantly involved in misconducts. Sharing an experience with one student who was continuously fighting with his peers and showed no interest in school, the principal commented that while discussing the situation with the student, she learned that in past days he had said to his classmates that he was going to Mexico City with his father, and that when this did not happen his classmates started teasing him and therefore he started acting out in class. What followed was an agreement with the student and his

[125] Informal observations conducted during a Mathematics class confirm the idea that there is a controlled environment in the classroom.

mother but most importantly, the principal spoke with the entire group and all of them signed an agreement to end the situation.

According to the teacher, having control of the discipline has major implications for the students' ability to participate, due to the existence of an environment of respect and focus on academic work. In addition, having a disciplined classroom enhances the overall effectiveness of instructional time as it frees the teacher to concentrate on teaching rather than in policing the students' behaviour.

2. ACTIVITIES AND TEACHERS' ATTITUDES

As mentioned at the beginning of the chapter, once the teacher practices promoting student engagement were studied, the second aim of the analysis was to identify practices not included in the econometric model, as well as individual characteristics and contextual factors that may be crucial in promoting student engagement and attainment. In order to achieve this objective, inductive analysis was conducted to examine the interview's data.

The findings suggest that students were more engaged in classes that involved hands-on projects and where students make use of technology as part of their routines. In addition, the accounts revealed that students feel engaged due to the fact that the teacher is enthusiastic during class-time and enjoys teaching them. The results are summarized below.

2.1 Fun and dynamic activities

The teacher's accounts suggest that students are engaged in the course material when they like the topic, when they play, when they manipulate and create, and in general when the activities 'touch their sensitivity'. When asked about the class he thought students enjoy the most, he did not hesitate to say it was *Science and Technology*, although he also expected they enjoyed Language, as it was his favourite class. In line with the teacher's perception, the students overwhelmingly referred to *Science and Technology* as their favourite class, together with *Natural Science*, *Art and Culture*, and *Information and Communication Technology ICT* (and to a lesser extent to Language and Mathematics).

The students' accounts revealed that what these classes have in common is that students conduct experiments, work on hands-on projects, play games, conduct learning activities

outside the classroom, build models and design posters, and make expositions and present them to their classmates and to other students in the school. As a result, students often have tangible products, learn about real-life problems and improve their skills to use technology. Students spoke passionately about these activities, as exemplified in Julio's comment:

> I like Science class because we make posters, models, drawings, videos and presentations; for instance, right now we are preparing a presentation on the universe; I made a model with the classmates I had to work with, right Isabel? With posters … and yeah, I really like it because those things make me learn how to do other things.

An important remark made by the teacher regarding the Science and Technology class is that unlike other subjects, which follow the curriculum developed by the SEP, this class follows the Science and Technology for Children Programme designed by the Smithsonian Institution in the United States. The school adopted the programme more than 12 years ago as a suggestion from the principal, who was the 6th-grade teacher at the time. The teacher also indicated that not all schools adopt the programme, as they need to apply to be part of it, and because it increases the workload for the teachers.[126]

Although not all students mentioned Mathematics as one of their favourite classes, the vast majority agreed that they enjoy *the use of games* during this class and mentioned that *games help them learn*. Games are mostly used during the *Mathematics Workshop*, which is a subject that only schools in the full-time programme are able to deliver (due to the extended schedule). However, according to the principal the school has been implementing the Mathematics workshop since long before they joined the full-time programme:

> The next evaluation arrived (with excellent results for the school) and some people came to see what we were doing, and guess what? I was afraid they knew we were working in Mathematics workshops because those were agreements *within* the institution … but that were succeeding. I brought teachers from the teachers' center to give my teachers training on how to play with Maths, how to play with dices, how to teach basic operations while paying, and that's how we strengthened the Mathematics workshop. I mean it was not just about playing; we had to train them to take advantage of the time we were taking from the curriculum.

[126] The teacher commented the school had received recognitions for the work of the principal (the 6th-grade teacher at the time) and the 5th-grade teacher in Science, such as the visit of the Nobel Prize in Chemistry winner Mario Molina.

Besides the activities, students considered fun many other school events such as the trips to the museums, to the pyramids, to the movies, to the universities, the celebrations such as Day of the Dead and Mothers' Day, the sport competitions, and performances where they recite poems, sing, dance and present plays, among others.

The students' perception that the school is a fun place to be is of paramount importance to understand student engagement in this school. This was evident during a school visit, when the principal asked students (who were about to leave for a two-week holiday) who wanted to go on vacation, and only a few students raised their hands. Later on, during the interviews, students were asked why this was the case, and they unanimously commented that they did not have fun during the holidays because they remain at home, sometimes alone, bored, doing chores or taking care of their siblings. Instead, they argue that in the school they enjoy being with their teacher and friends and were constantly doing exciting activities. Diana illustrated this idea, when she commented: 'I prefer to be in the school because here we share moments with teachers, friends, and at home we are only doing the chores, or washing dishes and we cannot go out and play for a little while and they leave us locked in.'

2.2 Teacher's positive attitude and enthusiasm during class-time

When describing their experiences in the classroom, the vast majority of students suggested they valued the positive attitude of the teacher during the lessons. Many pupils highlighted that in the context of daily routines and interaction in the classroom, the teacher jokes around, tickles them, plays with them, and makes them laugh. For instance, Melisa and Julio commented: 'What I like about teacher Diego is that he is very cheerful, smiling … he is very good to us and he is very creative', 'when we play (…) is like he had a child still inside him.'

The students also mentioned the teacher is enthusiastic, enjoys teaching them and likes the topics addressed during the lessons. For instance, Adriana stated: 'he does not explain to us with gestures, with a long face (Claudia: he is not bored while explaining), he explains to us happily until we understand him.'

These findings indicate that the positive attitude and enthusiasm that the teacher has towards the students, the activities and the topics, and the fact that activities are fun, influence the behavioural engagement of the students. This is the case, as students

themselves start having a positive attitude towards their time at school and the activities in the classroom, and become more actively involved in them.

3. PARENTS ARE *INVOLVED* AND PLACE HIGH VALUE ON EDUCATION

Both the teacher and the principal were emphatic in mentioning that the majority of the parents have the best intentions, disposition and commitment to the education of their children. Specifically, when reflecting about parental involvement, the teacher mentioned that although the majority of the parents have low education levels (a condition he relates with lack of commitment), 80 per cent of the parents of his 6th-graders were *engaged* in the education of their children.[127]

The accounts from 12 students corroborate the idea that their parents care about their performance and place high value on education. Students mainly refer to their mothers when talking about parental involvement. The following comment summarizes the students' thoughts in this regard:

> Manuel: One day the teacher told my mom I was not doing well at the school and that she needed to support me with my reading, when I arrived home my mom was behaving oddly and when I told her I was going to play outside, she said: 'no, sit down, until you finish five readings you cannot go out' (…) my mom works but now my sister arrives early and she makes me read and then when my mom arrives at night she also makes my read. (How are you doing now?) Better.

The participants' accounts suggest parents' encouragement for academic participation, prioritization of schoolwork (e.g. over child labour), promotion of a home environment characterized by discipline and provision of emotional support, translated into higher standards for school achievement, higher levels of behavioural and cognitive engagement, and ultimately to better educational outcomes.

Challenges for engagement at the classroom and individual level

Although the analysis of the data pointed out several practices and activities that lead to student engagement, the analysis also revealed that individual factors as well as some characteristics of the activities performed in class undermined the students' ability to

[127] When the teacher was asked to explain further, he commented that engaged parents attend the monthly meetings, frequently asks him about the performance of their children, sign the homework as requested by him, and show concern when their children are struggling in school. According to the teacher, about half of the parents attend the designated time on Fridays to ask about how their children can make up for bad grades, to ask about how their children are doing, or ask about homework, among others.

become engaged. Similarly to the results about *activities* and *teacher's attitude*, the findings summarized below are the result of conducting inductive analysis.

1. REPETITIVE ROUTINES

Although the students suggested they enjoy their time in the classroom, they also commented emphatically that this was not the case in all subjects. The students overwhelmingly referred to the History class as boring and tedious as well as difficult and irrelevant, and some of them even mentioned they misbehave during this class and feel sleepy. The majority of the students suggested they did not enjoy this class.

In order to have a deeper understanding of the students' thinking, they were asked to reflect on the difference between this class and others that they like. The students' accounts revealed that unlike other classes, the central activity in the History class was to look in the textbook for the answers to questions provided by the teacher and write them down. At the core of the students' reflections about the difficulties of engaging in this class was the fact that *they were expected to memorize material as opposed to having an active experience through participation or experimentation*.

An important remark is that high achievers also mentioned their struggles in this class, which indicates that even the most motivated students need to be active agents contributing to their learning in order to become engaged.[128] These findings highlighted the importance of providing students with opportunities to apply their understanding, to construct knowledge and to develop their analytical skills.

2. INDIVIDUAL WORK

A total of 16 students revealed they are less engaged when working individually, as they feel frustrated when they are not able to complete the tasks and cannot discuss with their peers, and because while working collaboratively they motivate each other.[129] Discussing

[128] Most of the students also stated they were disengaged in Geography, where they also need to answer questions using the textbook. However, they mentioned the difference between the History and the Geography class was that they found the content in Geography more exciting and relevant. They also mentioned they were disengaged in the Ethics and Civic class when the teacher does not use videos; in the Mathematics class when they do not understand the teacher; and in the classes at the library as the communication with the librarian is difficult as she has a hearing impairment.

[129] Although the majority of the students share this idea, high achievers suggested they are equally or more engaged when they work alone, because sometimes they get distracted by their teammates while working in groups.

collaborative work, the teacher commented that *he appoints a team leader in every group* who is responsible to support the other member in the group, and *encourages all students to help their teammates not to wander off subject, or get distracted*. Discussing the support provided by his teammates, Antonio stated: 'I learn more working in groups than individually because, as Claudia was saying, we get bored, instead when you are in a group you have people who support you, we focus on the work and then when we finish we talk or play.'

These findings revealed that the lack of cooperation between students influence (negatively) their behavioural engagement, as students become bored and lose interest in the course material which decreases their *participation*. In addition, the findings introduce the idea that student engagement is not solely determined by the teacher practices but can also be facilitated by peer interaction.

3. DISADVANTAGED SOCIOECONOMIC BACKGROUND

3.1 Inadequate academic support from parents

As mentioned before, parents were willing to provide emotional support to their children and were committed to their education. However, the teacher and the principal pointed out that some of the parents have difficulties helping their children in the academic endeavours. This implies that these parents do not have the knowledge to help their children with homework; do not have enough time to reinforce knowledge (e.g. read to them as requested by the teacher); and do not understand the importance of some practices, among others. For example, some of the parents do not allow their children to use the books they bring home in the *travelling backpack* because they are afraid the books will be damaged and they will need to pay for them, something they cannot afford.[130]

[130] Once a week the librarian provides two students in each grade level with a *travelling backpack*, which contains books for the students to take home and read with their parents.

In general, the principal suggested that parents 'do not understand the support they need to give to their children' nor have the 'strength, education, time and means that will allow them to be waiting for their children to arrive and help them with their academic tasks.'[131]

3.2 Difficult home environment

The principal's accounts and also discussions at the School Technical Council revealed most of the students in the school are deprived of basic needs and some of them are exposed to difficult home environments. Reflecting on the importance of context the principal asserted: 'It is important to understand this context where every day you see children who have a dad today and tomorrow have another one, who are abandoned by their mothers, who are mistreated, who have not eaten, who sleep on the floor.'

Similarly, the teacher suggested that some of the students did not live with their parents as they had migrated to the United States looking for better jobs, and that some of the students also have an ultimate aspiration to cross the border. This implies that these students live with one of the parents only, with a relative, or even with neighbours, and that they have to take care of their younger siblings, cousins and have major responsibilities in the household.

The following comment made by the principal when asked to reflect on her expectations for the students, illustrates the influence that the context is having on the students' ability to succeed in the long run:

> Look, you don't know how it hurts when a child returns to the school and we see that this boy or that girl we taught to be punctual, to be clean, to study hard, has changed because has been absorbed by the context, they crumble, they return with dirty uniforms, all hairy, all shaggy … here they met the requirements because they had to, but once they have the freedom of choice, we lose them … when you have to build habits that they did not receive at home, but that were learned here, it's hard to keep them … the context makes them collapse (…) sometimes the little school falls in the fantasy, in my school everything is beautiful, clean, is organized, I get what I need and all, but when I get home? We have not yet

[131] Although this is the case, and the principal encourages teachers to work with the students as if they were 'orphans' (in the sense that some parents are unable to help the students), the teachers consider the academic support provided by the parents so important they help parents to provide academic support. Specifically, some of the teachers in the school call parents on Saturdays at the beginning of the year to explain how she or he wants them to help their children with Mathematics concepts and give them sample classes, for them to understand the processes their children are going through while in the classroom. After those lessons parents sign commitments on the strategies they will use to support their children at home.

> succeeded in making these children internalize those strengths, even though we try and try … the context is stronger.

In sum, the findings suggest that although parents value education, are involved in their child's schooling and even promote home environments characterized by discipline, the economic distress associated with the lack of financial resources available in their households, prevents students from participating and succeeding in school. Even in households where these risks are not as prominent, the fact that students do not receive adequate academic support from their parents, as a result of their lack of education or skills, also plays a major role preventing their academic success. Table 5.1 summarizes the enablers and challenges for student engagement in school AI2440.

Table 5.1. Summary of enablers and challenges for student engagement in school one.

Enablers for engagement at the classroom and individual level: Engagement is understood as having a behavioural and a cognitive component
1. TEACHER PRACTICES
1.1 Academic Personalism 1.1.1 My teacher notices if I have trouble learning something 1.1.2 My teacher is willing to give extra help on schoolwork if I need it 1.1.3 My teacher helps me catch up if I am behind ***1.2 Trust*** 1.2.1 My teacher treats me with respect and always listens to my ideas 1.2.2 My teacher cares about me* 1.2.3 My teacher takes the time to get to know me* 1.2.4 My teacher is my friend* 1.2.5 My teacher promotes good relationships among students* 1.2.6 My teacher motivates me* ***1.3 Clarity*** 1.3.1 It's clear to me what I need to do to get a good grade ***1.4 Discipline*** 1.4.1 My classmates do behave the way my teacher wants them to
2. ACTIVITIES AND TEACHERS' ATTITUDES*
2.1 Fun and dynamic activities ***2.2 Teacher's positive attitude and enthusiasm during class-time***
3. PARENTS ARE INVOLVED AND PLACE HIGH VALUE ON EDUCATION*
Challenges for engagement at the classroom and individual level
1. REPETITIVE ROUTINES*
2. INDIVIDUAL WORK*
3. DISADVANTAGED SOCIOECONOMIC BACKGROUND*
3.1 Inadequate academic support from parents ***3.2 Difficult home environment***
Enablers for engagement at the school level
1. PRINCIPAL'S SUPPORT* **2. EXISTENCE OF A PROFESSIONAL LEARNING COMMUNITY*** **3. INNOVATIVE GENERATION AND USE OF SCHOOL RESOURCES***

* Themes that emerged from the data using inductive analysis.

Enablers for engagement at the school level

Given that the focus of the research was the classroom, the instruments were primarily designed to gather data from the pupils and the teacher. However, it was evident from the first visit that the head teacher was playing a major role in the results of this school. Although the interview for the principals was designed to be administered in less than an hour, she offered to answer to the questionnaire on a Saturday, when she spent three additional hours showing me around the school, talking about her personal story as a teacher and her experiences as a head teacher in the school.

The principal's accounts (and informal observations) revealed that she was a high energy and charismatic principal who had a transformational effect on her staff, who had a constant push for improvement and who puts achievement in the centre of her efforts. Most importantly, the analysis indicated that most of the teacher practices were in fact part of a school strategy lead by the head teacher. The practices described below are the result of conducting inductive analysis.

1. PRINCIPAL'S SUPPORT

Before becoming the principal, five years earlier, Silvia was the 6th-grade teacher for eight years and had worked in two other schools as a primary education teacher for 10 years (mainly in 6th grade). Both the teacher and the principal suggested that the principal's experience as a teacher has helped her to provide support focused on the practices at the classroom level. For instance, the teacher pointed out that the principal's expertise on the 6th-grade curriculum has lead him to have clear student goals based on the national curriculum and to design continuous improvements of it.[132]

When asked to reflect on the support provided to the teachers, the principal mentioned she conducts *classroom observations at least once a week* to make sure the planning and the instruction are in line; that she is *flexible with the class schedule* (e.g. teachers can teach one or two hours of *Science and Technology* depending on their needs); that she *cares deeply about disciplinary problems*; that she *unequivocally supports the teachers*

[132] The teacher also commented the head teacher is always suggesting new teaching strategies, sharing books on pedagogy, and encouraging him to continue with his training.

when facing difficulties, and that she *motivates teachers* (practice that the 6th-grade teacher finds particularly valuable).

Regarding this last practice, the principal commented that although she is continuously motivating teachers, she is equally interested in pressing for results:

> I mean not everything is love, this is my philosophical strategy to work with colleagues, I encourage you, I challenge you, but I can also warn you … you must give me a digital evaluation, show me … at the end of the year the 2nd-grade teacher has to tell the 3rd-grade teacher how is she going to send her the group, because you can embellish it, all my children can read, etc. But I'm hearing you … then in August in the meeting after the first month of work, I'll ask the teacher from 3rd grade if it's true or not what the one from 2nd said … I can tell prodigies, but let's tell each other the truth.

In addition, the principal commented on a practice that has shown to be highly effective in improving the quality of the instruction:

> I *create specialists*, for instance you, I see your strength and I ask you with what children you would like to work (…) so right now I do not move them, the teacher from 3rd grade has been years in 3rd grade, the one in 5th the same, as I tell them, you already master the curriculum, master everything, your only job is to reinvent yourself, to upgrade, the only person you have to challenge is yourself.

In the same line of thought the principal revealed that she was planning and preparing for succession by *identifying and training the future leaders of the school*. Her accounts revealed that she learned the importance of training teachers with the potential to be leaders from the previous head teacher who encouraged her to co-lead the school when she was still the 6th-grade teacher.

The principal's accounts also suggest that monitoring student progress and caring about their wellbeing is one of her priorities. The principal has the remarkable ability to know the students by name, especially the ones of those facing academic and social challenges, and displays an interest to be fully informed about the academic functioning of all students. Every two months the teachers are required to report the students with any type of difficulties, and during the School Technical Council, which takes place every month, the principal discusses the progress of each of these students (I corroborated this information during the School Technical Council).

As a result of the discussion, the principal suggests new interventions to be implemented by the teacher or by USAER, contacts parents, and helps the teacher by conducting

assessments herself, among others. For instance, she conducts an oral reading fluency assessment of all students in the school twice a year to value their progress.[133] In addition, the principal informs the parents of the results from these assessments by placing a blackboard in the entrance of the school containing the photo of the students in every grade level and their performance in the evaluation (see photo of the blackboard in Appendix 13).[134]

Another strategy mentioned by the principal to promote better learning outcomes of struggling students, was transferring students from one grade level to another, so they can learn in a classroom environment that 'better fits their needs and personality'. The principal provided the following example of this practice:

> Mauricio should not be in 5th grade, he must be in 4th grade, but he went to 5th grade because he is very mature for his age, in 4th grade he believed he was Juan Camane, that he could scream, that he could do whatever he wanted, so we put him in a group within his age range … here he keeps a low profile, the teacher controls the discipline and he is a child I no longer have problems with. (He officially migrated to 5th grade?) No, he is working in 5th, but officially he's still in 4th … he has worked very well with the content and has impressed us in the way he has appropriated it.[135]

In addition to her concern for the performance of the students, the principal suggested that she is also attentive to the 'human side' of her work. Examples of this include: nominating families/pupils to receive student financial assistance or government grants, and asking charity institutions for uniforms for students who cannot afford to buy one.

[133] During my visits to the school I observed the head teacher conducting reading tests to individual students.

[134] Other examples of the principal's monitoring include that she: supervises in person a play or a dance that will be presented at a school event; reviews the notebooks of struggling students, at the end of the school day or on Saturdays; and knows in detail the students who make library loans, the periodicity of the loans, and the genres of the books that are used more often by the students. According to the principal, this last information is extremely useful to determine if the students are cultivating good reading habits, one of the school's major goals.

[135] The principal also shared their experience with another student, named Lucas. According to the principal, he was a pupil that with the help of teachers passed the courses (before the arrival of USAER), to the point that he was already in 3rd grade and could not read and write. In this case, with previous consent from his parents, they sent him back to 1st grade because 'he lacked mental maturity'. According to the principal, in 1st grade he had the physical maturity to assimilate the experience and the content. Then, the following year they moved him to 4th grade (when he was in 4th grade he was studying the 2nd-grade curriculum). The student is now in 5th grade and according to the principal 'he reached the level, he found himself'.

2. EXISTENCE OF A PROFESSIONAL LEARNING COMMUNITY

The participants indicated the existence of a learning community where meaningful relationships and interactions between students, and between students and teachers are promoted, and where all members of the community (not only teachers) consistently take collective responsibility for student learning and have an undeviating focus on it. The following discussion presents the views of the participants on how this is materialized at the school level.

A first approach to the importance of the interaction between students occurred when students started referring overwhelmingly to the *activities to integrate* as activities they enjoy and help them learn. When asked to explain their thoughts, students commented these were activities they attended on a regular basis to get to know other students in the school,[136] and where they learn together.

Regarding the 'activities to learn', the students commonly referred to an activity where students from all grades come together to practice their reading comprehension and communication skills. The principal explained the activity as follows:

> As teachers we agreed to read to our students twice a week … on Tuesdays and Fridays students get out and form a line within seconds, it must be fast because we cannot waste time, we have made different types of readings like novels, fables, and what do we do? I tell the teacher your turn to read is within eight days, and she picks two, three children who are not her students and they prepare and present the reading. We all read: the intendant, the secretary, the IT teacher, the librarian, me (…) in the past two months we changed the genre to poetry, the teachers had to recite, and the children were delighted! (…) Does it have an impact? Sure, you know that words teach but the example razes … the interest of students in free and voluntary reading has increased, how do I know? The librarian keeps records of those who freely borrow books to read, and the children who go and seek the genre we are reading has increased by a large percentage.

A second characteristic of the learning community was the ability of the staff members to work collaboratively to improve the learning outcomes and wellbeing of the students. Specifically, the teachers share information on both their progress and struggles with all staff members, making it possible for them to get involved in the solution of the problems and to have deep knowledge of all students in the school.

[136] According to the teacher the activities where students from different grades get to know each other enhance fellowship, and create a feeling that they are part of the same community.

According to the principal, the School Technical Councils have contributed to this fluid exchange of information. During the Councils (as corroborated during an informal observation), the teachers present their objectives for the semester and evidence of their progress. For instance, when reporting on students with learning difficulties, the teachers present a photo of the student, his/her name, and a video showing his/her improvements or lack of improvement.[137] In addition, a person from the USAER presents the work they have done with students receiving special care. Interestingly, the person from the USAER was also open to discuss the failures in her strategies with some of the students.[138]

According to the principal, this exercise promotes accountability, increases peer pressure, and most importantly generates information about the students that is valuable for all staff members:

> Look, I have cases in 1st grade and I'm not the only one who knows them, the whole school does … the school knows who Gabriel is and then we follow him up, and then the questions arise from the peers: 'How is his progress?', and the teacher from 2nd grade is interested in those in 1st grade, why? Because eventually she'll have these children, the teacher from 3rd is interested in those from 2nd and so on. A chain of information and knowledge is built.

The students' account revealed that they value the interest shown by all teachers in the school, as captured by Carla:

> The other teachers know us from 1st grade and they already know when we are sad, happy, angry, and they come to us and ask us, and if it is the case they go with the principal who sends for us and speaks to our parents, uncles and so on … when we have personal problems, some peers go with the principal or with other teachers, and they try to make us feel less nervous and help us solve those problems.

In addition, data analysis indicates the decision-making process is not solely executed by the head teacher but instead is the responsibility of all teachers in the school. This is the case not only for major decisions concerning academic achievement,[139] but also include operational decisions, such as budget allocation, or the design of the class schedule. The

[137] The teachers also discuss domestic conflicts faced by students.
[138] During the Council the librarian, the IT teacher and all other members of the staff present a report on their work.
[139] Such decisions include the idea of working with rubrics, giving priority to group work, promoting the importance of ethics and values, and designing an *improvement route* that better fitted the academic needs of the students.

results revealed that the learning outcomes are always at the centre of the decision-making process.

3. INNOVATIVE GENERATION AND USE OF SCHOOL RESOURCES

Another important characteristic of the principal is her ability to mobilize resources for the school and ensure those resources translate into better learning outcomes. The availability of resources seems to be of particular importance, as students made continuous references to how school facilities such as the computer laboratory and the library promote their engagement in learning. The following discussion summarizes the exceptional resources found in the school.

The participants' accounts revealed the librarian (who is paid by the parents at the request of the principal) provides every grade level with the resources (books and material) needed in every lesson; once a week provides two students in each grade level with the *travelling backpack*; and delivers weekly lessons at the library, among others. In addition, the library is the space where students with special needs receive tailored instruction, and where students can use materials and spend free time.

Unlike most schools in the state, the school had the first five computers and Internet services 10 years ago due to the ability of the head teacher to request additional resources for the school from the local government. The principal commented that when they first received the equipment, all staff members received training in Microsoft Office, and that the IT teacher is in fact an administrator sent by the local government at her request.[140]

Similarly, the principal commented that 10 years before the introduction of the full-time programme, the school was already providing a weekly hour of Science and Technology, Computer Training and Mathematics Workshop (i.e. the subjects introduced by the full-time programme). In fact, she argues the good academic results of the school are largely due to the introduction of these classes.

Regarding the investment of time and resources as a result of adopting the full-time programme, the head teacher asserted:

[140] According to the principal, she has been able to maintain the equipment in good condition since she does not follow the bureaucratic procedure to ask for maintenance (which takes a long time) but instead the school or the parents pay for it.

> the benefit of the full-time programme is that there is more time to learn, but I insist, planning is what really impacts, you need to develop a schedule that harmoniously distributes the classes through the day, it must be an active schedule, so the child does not feel that at a certain point of the day he already did what he was supposed to do, because even parents see it as a waste of time (i.e. the extended time), no, no, that is not the case in this school.

Informal observations also revealed the existence of a stimulating physical setting (rare in public schools serving disadvantaged students) that might be contributing to the fact that students enjoy being at the school. For instance, the classrooms, as well as the open spaces, are decorated with colourful illustrations on the walls and ceilings (carefully painted by the teachers), printed curtains, posters, galleries and paintings. In addition, all classroom elements such as chairs, blackboards, computers, floors, bins and emergency kits are in clean and pristine condition (see photos in Appendix 14).

In addition, the environment itself is warm and inviting. For example, when students conduct their daily warm up, and when they enter onto school premises every morning, there is music playing to receive them and to raise their spirits.[141]

The principal's effort can be summarized in her willingness to apply for government funding programmes and public and private donations; to participate in pilot projects; in her ability to convince parents, politicians or any other third party of the importance to invest additional resources in education; and her good relationships with the local government, the union and other principals, which allow her to gather valuable information (for example about grants) to help her practices.

CONCLUSION

The aim of conducting the analysis was to identify the perspectives and practices of the teacher who promotes the relative high levels of cognitive and emotional engagement among 6th-graders in the school.[142] Although the quantitative analysis revealed a positive correlation between these two types of engagement and the practices *clarity*, *academic press*, *trust* and *academic personalism*, analysis from the interviews suggest that student

[141] An important remark is the notorious difference in terms of infrastructure and resources of this school compared to all the other 18 schools visited during the fieldwork. In any of the other schools there was a librarian or a USAER team as part of the staff, and only in a few of them there was an IT, Sport Education and English teacher, not to mention that in some schools there was no library, no computer laboratory, no dining hall, no running water and no adequate sanitary facilities.
[142] Behavioural engagement was not found to be relatively high in this school.

engagement in this school emerges mainly from the personalized support to students and from the rapport between the teacher and the students, that is, from *academic personalism* and *trust*.[143]

Specifically, students reported to be willing to exert effort and persevere (i.e. to be *cognitively* engaged), due to the teachers' ability to recognize their learning needs and provide *individual support* (this was particularly true for struggling students). The students also reported feeling identified with the school (i.e. to be *emotionally* engaged) due to the teacher's ability to *care* for them. This rapport with the teacher seems to be translating into *cognitive* and *behavioural* engagement due to the academic commitment students acquire with the teacher, who shows true interest and great expectations for what they can achieve.

The fact that the teacher has great expectations for his students is not of minor importance as some students reported not receiving adequate emotional support from parents, and since some pupils (particularly the boys) indicated they were considering having occupations that require no more than a high school diploma. Strikingly, the principal's accounts revealed that although she has high expectations for what pupils can achieve while in the school, she is much more sceptical about their ability to succeed in the long run.

Although the construct *clarity* showed the highest correlation with *cognitive* and *behavioural* engagement among the variables included in the econometric model (r=0.27 and 0.34 respectively), the qualitative analysis found that the only practice related with this construct that was implemented by the teacher was the use of rubrics.

Similarly, even though the construct *academic press* showed to be positively correlated with cognitive and behavioural engagement (r=0.21 and 0.18 respectively), the qualitative analysis revealed that the teacher does not often challenge his students or press for hard work (this is particularly true for special education students). This is the case as the teacher associates this approach to being harsh with students, which goes against his tireless efforts to make students feel comfortable and not stressed while in school.

[143] *Academic personalism* was found to be positively correlated with cognitive engagement (r=0.15), and *trust* was found to be positively correlated with emotional engagement (r=0.15) and behavioural engagement (r=0.08/p-value=0.08).

Although there was no evidence of a significant correlation between *discipline* and any type of engagement, the qualitative analysis indicates that some of the strategies used by the teacher to maintain discipline, promote the behavioural engagement of the students. Specifically, the evidence from this school indicates that involving students in the development of classroom activities and monitoring students constantly leads to student participation and helps students to stay attentive throughout the school day. The rapport between the teacher and the students also seems to be contributing to the pupils' willingness to abide by classroom rules.

Analysis of the qualitative data also revealed that although the teacher is able to engage the majority of the students (cognitively, emotionally and behaviourally), there are still some students who struggle to become engaged cognitively and behaviourally, and to a lesser extent emotionally. These students are seemingly apathetic, exhibit poor behaviour, are less willing to exert effort in academic tasks, and have low levels of self-belief. However, these students still indicate having interest in some of the subjects, such as Science and Technology and Physical Education.

Similarly, although the teacher is able to cognitively engage the students in the majority of the subjects, students feel disengaged in classes where they conduct repetitive tasks. Contrarily, students in this classroom reported to be engaged in classes where they work on hands-on projects, use technology, and build objects while working in collaboration with their peers. Students also reported to be engaged in academic activities due to the positive attitude of the teacher during class time.

Although the quantitative analysis showed a negative correlation (r=-0.12) between the variable *complab* (i.e. the existence of a computer laboratory in the school) and behavioural engagement, the participants suggested it is an important aspect to engaging students behaviourally and cognitively. In addition, the variable *complab* does not capture entirely the use of technology by the pupils, as their classroom is equipped with a computer, a video beam and a printer, which students use continuously.

The results indicate that most of the practices implemented by the teacher to engage students are in fact part of a school strategy to improve academic learning. However, this seems to be an indication of a major phenomenon, which is the existence of a learning

community, which shares beliefs about the purpose of their work as educators and assumes the collective responsibility for student learning.

This ensures that students are served not only by their teacher, but also by staff members, all of whom have an unwavering determination to improve their learning and ensure their wellbeing. The implication is that students seem to be exposed to several effective teachers in a row, and therefore their engagement, as suggested by the teacher, could be emerging from the effort made by the teachers in all grade levels. The evidence suggests that the existence of such community is possible primarily due to the effectiveness of the principal promoting harmonious relationships among staff members.

Although the teacher practices and educational resources seem to be exceptional in this school, both the teacher and the principal's accounts revealed that in fact only a few of these initiatives emerged from novel approaches suggested by the staff members, and instead are the result of following the suggestions made by the SEP or applying for funding, resources or projects provide by the government. The accounts suggest that the difference lies in the fact that the staff members (especially the principal) are willing to spend time applying for the initiatives in order to receive the additional benefits, and actually implement them.

Finally, a remarkable feature found in the analysis was the coherence between the discourse of the students, the teacher and the principal. That is, almost all information provided by one of the participants was corroborated or complemented by another participant. This contributed to the idea that efforts from all staff members were connected and that these efforts resonate with students.

CHAPTER 6: TEACHER PRACTICES AND CONTEXTUAL FACTORS PROMOTING AND CHALLENGING STUDENT ENGAGEMENT IN THE SECOND CASE STUDY

This chapter presents the findings from the case study conducted in school CO8304. As in the previous chapter, the purpose of the analysis is to provide an answer to the third research question, which enquires about the practices of teachers in the selected schools where students show relative high levels of cognitive, behavioural and/or emotional engagement. Following the same approach used in the previous school, inductive and deductive analysis of interview data was conducted. The results from the analysis are presented in section one. The chapter concludes with an examination of the qualitative results in light of the quantitative results.

SECTION I – Results: School CO8304

Following the structure used in Chapter 5, this section starts with a description of the school's characteristics, followed by a summary of the teacher's reflections about learning and engagement. The section then presents the findings related to the enablement and the challenges for achieving student engagement, and differentiates whether they occur at the classroom, school or household level.

School characteristics

School CO8304 is situated in a community of 200 inhabitants, and is located 51 kilometres away from the state capital. The school is not part of the full-time programme and it does not have a cafeteria or a library. Although the school has a computer laboratory, the students are unable to use it due to the deterioration of the equipment. The school has a multi-grade structure where the head teacher is at the same time the 6th-grade teacher (and the Physical Education teacher).[144] The 6th-grade teacher, who has a Licensure degree, has 14 years of experience in the classroom and five years of experience as a principal in the school. There is a total of 11 students in 6th grade and a total of 71 students in the school.

[144] The 1st- and 2nd-grade students have a common teacher as well as the 3rd- and 4th-grade students, and the 5th-graders have one teacher.

Teachers' views on learning and engagement

On asking the teacher to describe a good student, he pointed out that he values the *students' capacity to use their knowledge and skills in order to meet real life challenges*. During the interview, the teacher reiterated the idea that the objective of mastering the school curriculum was that students were able to continue learning throughout their lives:

> For me, a good student is the one who applies to his life what he had studied and who is capable of living his life in the best possible way in all senses, professional, occupational, sentimental, etc. thanks to what he has learned. I mean when knowledge is appropriated and makes life more satisfying … we can say that the student is good when he is integral.

When enquired about how students learn, the teacher first pointed out that even though students learn at different paces *they can all master the material taught*. He also explained it is *important that students master the basic knowledge*, in which all the future learning is based. The teacher also mentioned that *students learn by mimicking*, but that they need to improve what they are mimicking. He argues that for this to happen, *students need to understand the importance of what they do in the classroom*, and that *he needs to present them with interesting content* and *valuable questions that trigger their enthusiasm*.

To clarify the teacher understanding of *student engagement*, he was then asked how he realizes that a student is engaged. His response revealed *that he mainly understands engagement as having a cognitive component*. For instance, he equated being engaged to being able to have a discussion one-on-one with the teacher and ask questions as a result of that discussion; remaining in the classroom during the break in order to continue with the debate they were having during the lesson; and staying on tasks until he or she finishes the work.

In addition, the teacher suggested that students are engaged when they remain focused on their tasks, are prepared for the lesson, are disciplined and do not disturb others, all of which is related to being behaviourally engaged. In this regard, the teacher mentioned that it is not the case that students are engaged all the time, but that they have the ability to focus again rapidly after he gave them the instruction to do so.

Enablers and challenges to student engagement

The findings from the interviews are presented below and are focused at the classroom level. The analysis indicates that the enabling factors for student engagement are: *the teacher's practices*, *the classroom activities*, and *the fact that parents are involved and place high value on education*. In terms of challenges, the key factors are: *the teacher's attitudes* and *the difficult socioeconomic background of the students*.

Enablers for engagement at the classroom and individual level

This subsection explores the relevance of the practices included in the econometric model. Following the same approach as in the previous school, the interviews to the teacher and the students were studied using deductive analysis, using as nodes the practices/constructs included in the survey to students.

1. TEACHER PRACTICES

1.1 Academic Press

Academic press is defined in the survey as the extent to which students experience a normative emphasis on academic success and conformity to specific standards of achievement. Analysis from interviews revealed academic press as the most recurrent topic in the discourse of participants. Thus, four of the five items included in this construct appeared as promoters of students' engagement in this classroom. Although the interview questions were not specific for a subject area, the participants tend to refer mainly to their experiences at the Mathematics class. The findings for each item are summarized below.

1.1.1 This class really makes me think and I feel challenged

The participants' accounts revealed that the teacher has high expectations for what students can learn, and press for high academic standards. At the classroom level, this is materialized when the teacher assigns *challenging tasks to students*, *assigns tasks that need a set of skills in order to be solved*, and *encourages students to try to solve problems or tasks prior to his explanation*.

Analysis of the teacher's accounts revealed that although he does not start a new topic with complex tasks, he is keen on *providing students with problems that have difficult*

solutions when they are already familiarized with the topic. The teacher exemplified his point with the following analogy:

> If you ask a straight question, plenty of times they do not think … for me it is very important to ask questions backwards, so that the student has the need to think more, if you tell him 2 + 4 equals what, he will tell you 6, but if you tell him 2 plus what is 6, the question is different, or if I give him an answer and tell him to create the problem, that creates the need to think on the child and that need initiates a spark in the brain.

The teacher referred to the ability to *assign challenging activities and questions*, as the most important strategy to engage students in learning. According to the teacher this is the case as such activities trigger the students' curiosity, and develop their high order thinking skills. However, he mentioned that providing students with such activities requires effort, as in every class, students ask for more demanding and creative activities, and because he needs to design problems that can be solved using many different approaches.[145]

According to the teacher, when facing challenging tasks, students learn to persevere, realize they can achieve at a high level, and develop their ability to solve problems using different approaches. In this regard, the teacher mentioned: 'this teaches them that there must be an *attitude* towards studies, recognizing that if I can't go this way I will go this other way but somehow I have to get there.' Finally, he pointed out that students are learning even when they are not able to solve the problem, as in the process of solving it they discover new ways of thinking that they will use in the future.

All 11 students agreed that the teachers provide them with challenging tasks. In fact, they argue that they are more used to difficult problems than easy ones and that the difficult problems make them think and help them reflect on why it is that they are wrong. The following reflections help to elucidate the students' thoughts in this regard:

> Henry: Difficult problems help us to learn because they force your brain to learn how to solve a more difficult problem in the future … there are times when we already have all those difficult things in mind and he returns to the easy ones and we can't answer them because we already have in mind how to solve the difficult things.

[145] The teacher mentioned that he has a question bank that helps him to follow up on the students' ability to solve problems and better identify areas of weakness.

> Sara: Right now, the teacher gave us a project related to energy transformation, and for me those projects are the most difficult because we have to build a mechanism to transform energy, but I feel that he wants us to improve and know we can do more advanced things.

Although this was the view of all students, one of the students pointed out that when the tasks are very demanding, she gets discouraged. She explained that this happens when she tries several times to solve a task, and every time the teacher says it is not correct, so she stops trying and starts talking with her classmates. When the teacher tells her to start trying again, she does it, but according to her, with 'less intensity'.

In line with this practice, the teachers often *present students with problems that require more than one operation or skill to be solved and which do not have an evident solution*. Although the students did not mention the fact that they need to use several operations or skills to solve a task, during the fieldwork it was evident that this was the case. For instance, during a Science lesson I observed a thoughtful discussion between the teacher and one of the students about how to use her mathematical skills in a problem that asked her to transform solar energy into thermal energy. Using an example from the Mathematics class the teacher summarized his thoughts in this regard:

> I have an expected learning, which is that the child can evaluate data using percentages, so I say, if the child already knows percentages, and he also knows decimal numbers and fractional numbers, why not make a problem which includes the three operations and where at the same time he has to use percentages, so the instruction shouldn't be 'tell me the percentage of green marbles, red marbles' (…) instead, the instruction should be 'make a pie chart to represent the marbles you have', there I am evaluating percentage but also decimals, fractionals, that the child knows how to use the ruler, the compass (…) by using more concepts they improve their performance.

Five out of eleven students pointed out that *the teacher encourages them to try to solve the activities prior to his explanation*. Their accounts indicate the teacher is patient and provides plenty of opportunities and time for students to reflect on possible solutions to the activities. These opportunities are provided when the teacher introduces a new topic or when students have to develop a new project:

> Sara: When he has something new in his mind, he first gives us a problem to see if we are able to meditate on it without an explanation, he allows you to answer it, you give the results to him, he lets some children explain what they did and only then he explains …

> Henry: He wants to develop the child's mind that the child discovers where is the mistake and what he did wrong.

The students' comments revealed that they are aware of the fact that, by not having an immediate solution, they are exerting more effort in the task. For instance, Teresa mentioned:

> When he assigns you very difficult things (…) and he sees that you are breaking your head to be able to do it, he realizes how much you really care about understanding, then if you did not succeed, he explains it to you, but first he gives it to you when you don't know anything so you make the effort to answer, and the one who answers realizes that her ability is great.

1.1.2 My teacher expects that I do my best all the time, and that everyone works hard

In addition to providing students with challenging work, the teacher reinforces and recognizes effort, so students work hard, even on activities that challenge them. In this regard, the teacher made a crucial remark by pointing out that the likelihood of the students dropping out in secondary school will depend on the extent to which students strive and succeed during primary education. In order to reinforce effort, *the teacher establishes stringent requirements about the quality of the schoolwork* and *expects students to keep the focus and hard work at all times*.

When asked to expand on the importance of having *rigorous standards for schoolwork* for the permanence of students in the school system, the teacher commented:

> They know for instance that presentation and content are important in the summaries they give me to check every day; the coherence of ideas, that they answered what was asked, so I ask them to give me decent work … if I teach children to work with quality now, I think they won't find difficulties to do the assignments in high school and therefore they would get good grades. This is very very important to me, if you help children to finish primary school well, they will definitively have less chances of dropping out from school in the future.

In line with this comment, all students agreed that the teacher does not accept schoolwork that is not carefully done, that is incomplete, that contains spelling errors, that is not clean or that is not submitted on time, among many other problems. One of the students suggested that after reviewing the schoolwork, the teacher returned it, letting them know who did a good job and who did not, and what the corresponding scores were. The

majority of the students also pointed out that when the work was not carefully done, they needed to improve it:

> Henry: The teacher takes quality into account, if it is dirty or poorly made, he returns it and asks you to do it again, he gives you like a day and you have to deliver it better, with good spelling, clean and so on, but he will no longer give you the same grade because he gave you one more day to do it well (compared to other children) so it is not fair. (Sara:) But you do not reach 10, even if you did your best and it was perfect the second time.

In addition, the teacher pointed out that although having rigorous requirements about the quality of the schoolwork was crucial, this practice should be coupled with a permanent emphasis on effort.

The students' accounts suggest that they indeed believe that effort is important, and that it is linked with achievement. One of the students pointed out that effort can be exerted through hard work when doing a project or a task, but that can also be exerted through simple actions that require effort, such as paying attention when the teacher is explaining, listening carefully to instructions, and not getting distracted by other students. The student also commented that the teacher insists they should be proud of their work, and have a positive attitude towards schoolwork. The following comment helps to elucidate what students understand by *effort* and how the teacher promotes it:

> Sara: we have to make an effort to do well in the assignments; for instance, in the sculptures you saw, one could make them just to accomplish, but the teacher tells us that *if you make an effort it is reflected in the work* … and you can see your effort because the sculpture looks more shaped, and also on the other subjects; for example in the machines he asked us for today, he has to see the effort that the child made, because the teacher does not like that someone else helps us. For him, effort is the most important thing.

The students also suggested the *teacher expects they are focused at all times*. For instance, they commented that it was unacceptable for the teacher that they did not bring homework because the day before they were sick, as he expects the student to go to a classmate's house to enquire about the homework. Other students pointed out that the teacher does not notify them when the examinations will take place (i.e. quizzes, not major exams) as he expects students to know previous lessons.

1.1.3 I have to work hard to do well

Another component of the academic press exerted by the teacher is that he only *provides recognition to high student achievement*. According to the teacher, he is transparent about the quality of the schoolwork:

> Something I do not do is say something is nice when it is not, I mean if it is wrong, it is wrong, they know that getting a 10 is very difficult with me if they don't deserve it; if you see my children's grades you won't see 10 (…) what's the point of giving them 10 if they do not deserve it? So I better focus on the expectations I have, for instance you who've got a 4 will get to 4.2 tomorrow, I do not want 5, I do not want 6 all of a sudden, I want to focus on what is wrong and start improving.[146]

When enquired about the effort they needed to exert to get a good grade, all students agreed that they needed to work hard to do well. In addition, they thought that the judgement of the teacher regarding schoolwork was tough but fair, as pointed out by Patricia: 'The teacher is fair because for instance not everyone gets 10 in the tasks that he assigns, when he says *you deserve it* is because you really deserve it, but if you don't, then you don't get a good grade.'

Given that students seem to have clarity about the importance of working hard on schoolwork, they were then asked if this was the case. Surprisingly (given the students' accounts), only five students stated that they work hard at school. They suggested they work hard by submitting the homework on time, studying for the examinations, presenting beautiful expositions and projects, and paying attention to the teacher, among others. The other six students explained that they needed to work harder, or that they could greatly improve the work they submit.

When asked about the motivation for them to work hard, the five students agreed that they study because they want to obtain good grades, and because they want to make something of themselves in the future, something that their parents encourage. Interestingly, two of the students also mentioned as a reason, that they wanted to 'help the teacher' because of all that he does for them, because he helps them to achieve their goals.

[146] The teacher was equally emphatic about having rigorous requirements for grade promotion.

1.1.4 My teacher wants us to become better thinkers, not just memorize things

The participants' accounts suggested the teacher exerts academic press by expecting students to engage in deep and rigorous thinking, and not in repetitive routines characterized by the use of memorization. For instance, when asked in which subject it was easier to engage students, the teacher did not hesitate to answer that it was in Mathematics, because in this class he promoted the students' 'desire to think and solve problems' and that was something they enjoyed and were excited about.

To exemplify how he promoted the students' desire to think, he commented on the importance of not providing students with algorithms or formulas when first introducing a mathematical operation or any other concept, as this prevents pupils from reasoning and limits their thinking. In the case of Mathematics, he suggested students should learn the basic operations by understanding what they need to do to conduct such operations in their minds and find their own approaches to conduct the operations.

In line with this idea, eight out of eleven students agreed that they usually calculate the basic mathematical operations in their minds,[147] but most importantly they discussed the difference between conducting operations 'mechanically' and 'reflecting in their minds'. This idea was explained by Teresa:

> Reasoning is knowing to what result we are going to get and understanding why we got to that result, and why am I doing that operation and not another, it is also knowing what you can do to get faster to such result (…) mechanically on the other hand is when you learn the multiplication tables and you repeat them but without thinking.

A remarkable comment made by Patricia highlighted the importance of promoting understanding to increase engagement. As part of the discussion, she commented:

> I prefer reasoning instead of doing things mechanically … before I did not want to come to the school because the teacher we had only taught us to do the exercise, how we were going to do it, and he assigned us many exercises like that, repeated, and he only evaluated you, if you did well, good but if you did not, he didn't even tell you what you did wrong, on the other hand, teacher Sebastian explains to us

[147] The students' accounts were corroborated during an informal observation in a Mathematics lesson, where students were asked to conduct a three-digit number division. Remarkably, once the teacher gave them the operation they seemed to follow a well-known protocol where they put their pencils down and started doing the calculation in their minds. In less than one minute, eight students had written down their responses and had enthusiastically raised their hands, ready to explain the result, which included decimal points.

> first, he explains well and tells us where we are mistaken and why we got that result.

A final remark made by the teacher was that although his priority was to make students reflect on the contents, he was aware of the fact that a few students in the classroom learn the material using their memory. According to him, these students will continue to do so, as they did not receive the adequate support in previous years (and especially at home) to develop their ability to reflect and comprehend.

1.2 Academic Personalism

Analysis of the data revealed that press towards high academic standards is coupled with ample personal support to students, which results in pupils having a realistic probability of responding successfully to those standards. In this research, this proactive support that students receive to help them achieve their academic goals, is defined as *academic personalism*. The findings revealed that two of the five items included in this construct are relevant for student engagement in this classroom, 'my teacher notices if I have trouble learning something', and 'my teacher helps me catch up if I am behind'.[148]

1.2.1. My teacher notices if I have trouble learning something

The participants' accounts suggest the teacher notices when students struggle to learn the material being taught by *conducting a diagnosis at the beginning of the year*, *monitoring students understanding during class time*, *verifying learning outcomes after the end of the school day*, and *maintaining a record to document the expected learning outcomes that have been met by the students*.

According to the teacher, the *diagnostic conducted at the beginning of the year* is not the result of applying a knowledge test to the students, but instead of analysing schoolwork and responses to assignments during the first week of classes:

> The initial diagnosis is key because from there you know who they are and (…) how you are going to help them to improve … I worried a lot given the results from the diagnosis because there were three students who have difficulties from 1st grade … I was shocked to have children in 6th grade who were not yet aware of the numerical series, it is an enormous lack of knowledge … I have made progress with them and they already know how to add, subtract, multiply and

[148] The other three items are: 'my teacher gives me specific suggestions about how I can improve my work in class', 'my teacher explains things in a different way if I don't understand something in class' and 'my teacher is willing to give extra help on schoolwork if I need it'.

> divide, which is a gain, but the learning of a student who has the grade-level knowledge, is not the same learning as a child who still struggles with the basics.

Although this initial effort is important to identify students who may struggle in the future, the teacher emphasized that his focus to notice learning difficulties occurs during class time, when he *systematically monitors students' understanding*. In order to monitor student progress, the teacher circulates around the classroom during seatwork to engage in one-to-one discussions with students; assigns tasks to confirm their grasp of learning material and identify gaps in their understanding; assigns struggling students a partner who informs him about the difficulties faced by the student; and pays close attention to students who are not participating actively.

Explaining the importance of assigning struggling students a partner (especially to those who feel uncomfortable discussing difficulties), the teacher commented:

> To give you an example, what I do with Leonardo, who is a very shy boy, is that I assign him a partner who has already absorbed the knowledge, to observe his processes and to inform me what he is doing right and what he is doing wrong (…) Of course, first I work with the boy who is doing well, and I tell him that he does not have to help Leonardo doing things, but he must verify Leonardo's steps to reach the result, and then that child who already knows the process of a problem (multiply, then add, etc.) comes and says: 'Leonardo is failing on this, teacher, he doesn't make this step,' and I focus on that information on the board and turn to see Leonardo just when I explain the part where I know he is having difficulties.

In addition to monitoring student learning during the lessons, the teacher *verifies their learning outcomes after the end of the school day*. In fact, he commented that this practice is key to determining who needs extra help. The accounts suggest the teacher spends a considerable amount of time reviewing the students' notebooks containing the work of the day, but most importantly, reviewing a particular homework where he asks students to provide a detailed description of the process they went through to solve a task. The following comment clarifies this practice:

> When I leave them a Mathematics problem I ask them to write me what they did to get to the result, what their brain thought, and I easily notice when a student went step by step following a logic and when he didn't … that writing has a value for me as you have no idea, because it allows me to say, this child is missing this, or this child is not lacking anything … this writing not only lets me see problems they have understanding Mathematics, but it is also fundamental to see their writing skills (…) with that information I start to correct and to focus my explanations.

Finally, the results pointed to the importance of *maintaining a record to document the expected learning outcomes that have and have not been met by the students*. This exercise generates useful information for the teacher who uses it to identify gaps in the knowledge:

> I have an excel chart in which I have listed the expected learning of that day per child, and I'm not the one who appoints that expected learning, this is on the teacher's book given to us by the government … the rate goes from 0 to 10, where 10 means that they really understood; that chart also gives me a lot of clarity about the general learning of the course, for example I can say that 70 per cent of children already know how to multiply fractions, and like that I see the evolution of children as well as the topics in which we need to continue working.

The teacher commented that in order to conduct a thorough monitoring of student learning, the teacher should be a sharp and perspicacious observer. However, he suggested the fact that there were only 11 students in the classroom greatly influenced his ability to monitor students one-on-one. When he was asked about how this would change if he had a larger number of students in the classroom, he commented that without a doubt it would be more difficult, but that with more dedication on his part (i.e. more time spent monitoring their progress) and rigorous classroom discipline, the same standards of supervision could be achieved.

1.2.2 My teacher helps me catch up if I am behind

Once the teacher has identified students who are experiencing difficulties understanding the material being taught, he focuses on providing the support they need to succeed in their tasks. To ensure that no student is left behind, *the teacher explains the lesson as many times as needed*, *is open to modifying his teaching approach when students have difficulties understanding the material*, and *perseveres in his efforts when faced with setbacks in the classroom*.

All students agreed the teacher was *willing to explain a lesson as many times as needed*. Both high and low achievers were enthusiastic, providing examples of the countless opportunities provided by the teacher for them to understand. The following comments summarize the students' thoughts in this regard:

> Sara: If you did not understand and the class is running out, he stops there, but the next day, or the day we have class again, he explains it again, he always wants to be sure if we understand him or not.

> Antonia: First the teacher gives us some time to answer but if he sees that we are not able to do it he asks the group – we are two or three – to go to his desk and he explains to us; we tell him that we understood but he tells us 'let me see it! Do it here, I want to see it' or he asks you to solve it at your desk and then to go and show him your notebook. If it's okay he asks you to explain the analysis and the process you followed.

The students' accounts also suggest the explanations provided by the teacher are directed to the entire group as opposed to being confined to the students who had trouble understanding. In this regard, Estela commented: 'He explains to everyone again because he says that even if some got poor results, he will repeat it because maybe there are other children who have not understood it either.'[149]

When asked if there were moments when he personalized the instruction, the teacher asserted that even though it is not his 'style' to go to the students' desktops to work with them, or to highlight with red the mistakes in each homework, he does provide individual support when a student has repeated the same mistake several times or when an explanation is only relevant for him or her.[150]

He also mentioned that he personalizes the instruction in the sense that he uses the students' innate interest in a specific subject to engage them in school work:

> Juan did not like to study, but from the beginning I saw that he loved Maths, so I told myself I will push him from there, and we started to make exercises and exercises and I started to tell him, look! Before you were not capable of doing this, so he improved little by little … as a matter of fact at the beginning he didn't even know the multiplication tables, later he was improving in the exercises and then when he realized that he learned when he studied I started to tell him, this same effort you put into Maths you are going to put it now into Sciences, History … and now he likes to read, to be able to answer the questions, he likes to study.

Interestingly, the teacher also drew attention to the fact that he is more than *willing to change his approach when he notices it is not working*. Sara made this evident when discussing her experiences in the History class:

> No one likes History and we've tried in a thousand different ways, with questions, concept maps, synoptic charts and we still do poorly on the exam; this time the teacher said we were going to try with summaries to see if it works. (Estela:) When

[149] Although all students agreed that this practice is extremely valuable, one of the high achieving students also commented that sometimes she gets bored, because she has already understood and the teacher continues explaining several times to the other students.

[150] The teacher also pointed out that he provides individual support to the three students identified after he conducted the diagnostic. According to his accounts, when the school day is over, and all the other pupils are gone, he helps them catch up with their peers.

> we do poorly on the exam he says, 'I will do something else so you can understand it better', he gives us another technique and then we present the exam and then he realizes if it worked or not.

Although students consistently suggested they valued the support provided by the teacher, this idea was evident when they were discussing the approach of a previous teacher:

> Patricia: The previous teacher we had in Mathematics made us work a whole week on the same exercise …
>
> Henry: We had to find out the answer ourselves. (And did you?) Some did and some did not …
>
> Antonia: He explained to us one time at the beginning of the class, but he did not care if we understood or not, sometimes he explained to us again, but I do not know if he got bored or what, but he ended up saying 'you better do it in the afternoon and tomorrow you'll tell me how you did it, or if you could answer it or not', if we had not been able to answer it, he explained, or he thought he did it … then he asked us to compare our results with others but we all had different answers, eventually, one of our classmates who had understood would explain it.

In line with the students' perception about the unwavering determination of the teacher to help them learn, the teacher commented on the importance of *being perseverant when facing difficulties*:

> As a teacher, there are times when I say that I can't do it anymore, then I take a break, I leave the class; the easiest thing to do would be allowing that child to pass, but then I start thinking about it in the afternoon, 'What can I do for this child so he understands?' And it's really traumatic to go back the next day to try again a different thing and that the day ends and he still does not get it … I believe that the patience of a teacher must be huge, we need to be able to say, ok he did not learn it again today but somehow he will understand … the fact is that they do not understand because the teacher has not found the way to explain, that's why you have to look for several ways, and in the end they will always understand.

The results presented above revealed that academic press coupled with personalized and timely support results in the students being able to keep up with high standards of student achievement. This is the case as students improve their self-belief, increase their participation, are focused during class time, and spend more time understanding and mastering the course material.

1.3 Trust

As mention before, *trust* is defined in the survey as the extent to which students and teachers share a high level of mutual trust and respect. Although the findings consistently

demonstrate the existence of a cordial relationship between the teacher and the students, they also reveal that this relationship is not one of friendship but instead an academic relationship. One of the items included in the construct *trust* (i.e. 'my teacher treats me with respect') was found to be relevant for the participants, while another two 'new' themes emerged as promoters of student engagement (i.e. 'my teacher sets personal boundaries', and 'my teacher is honest with me'). The results of the analysis are presented below.

1.3.1 My teacher treats me with respect

All the students in the classroom suggested the teacher was 'good with them' and treated them with respect. The students related *respect* with the fact that *the teacher treated them with decency*:

> Henry: He has never been disrespectful, as Antonia said, he's never been rude to us, he tells us off when we do bad things but never with rudeness or so …
>
> Paula: he is very careful whenever he talks to us.

The students' accounts also suggested they perceived the teacher as *respectful* because he was *considerate* with them. Specifically, the students mentioned that the teacher 'put himself in their shoes', was patient, always helped them to do better at school, tried to understand their decisions even when he did not agree with them, took into consideration their opinion, and very importantly because he treated them as equals.

1.3.2 My teacher sets personal boundaries

When asked about his relationship with the students, the teacher answered that even though he cares deeply about students' wellbeing and builds rapport with them, he also *sets boundaries that allow him to maintain the discipline and respect required to be an effective teacher*. The following comment made by the teacher helps to elucidate his view in this regard:

> I have a friendly relation with my students, always without losing the respect. I try to talk to them in the classroom as if we were two acquaintances, because maybe 'friendship' entails more things, but I am truly interested in their lives, and I try to look for opportunities to start conversations with them, never lose communication … I try to know what their problems are and to support them (…) I have tried to be the person outside their home they can trust, and it is very important for me not to betray their trust and to try not to break my promises (…)

> Many times they stay with me during the break and start telling me things that are not related with the school, personal conversations in which we can be friends, but when the bell rings, I go back to being the teacher.

The teacher also suggested that he is not warm or affectionate with his students, that he scolds them when they are not focused on the schoolwork, that he has a very strong temperament. Thus, his impression is that students believe he is not good with them and that they are afraid of him. However, according to the students' accounts this impression is far from reality. Although the students agree that the teacher has a strong voice and scolds them when they are not paying attention, do not participate or do not submit their work, they believe that he does it to help them, and do not feel hostility from the teacher.

1.3.3 My teacher is honest with me

The participants' accounts also revealed a remarkable characteristic of the teacher, which is that *he is extremely open and honest with the students about his personal struggles and failures*. For instance, the teacher mentioned he has no problem letting students know when he has made a mistake during a lesson or to recognize he has difficulties teaching a subject. The accounts indicate that the purpose of being open with the students is to teach them the importance of having character and perseverance in order to achieve their goals.

The analysis also suggests the teacher often shares with the students' personal experiences, such as his struggles as a teenager finishing personal projects or achieving at school. Although the teacher mentioned this was an exceptional event, he recalled a Language class where he started crying during an activity where students were reading poems. He explained he was not embarrassed of the situation, and did not try to avoid it, as it was important for him to let them know that he was highly invested in the activity and to show them the effects that poetry had on his feelings.

The students' accounts corroborated the idea that the teacher is honest and open with them. For example, as mentioned before, the students were aware of the struggles faced by the teacher in the History class. They also referred to discussions they have had during the lessons with the teacher, which resulted in them having this opinion. In their accounts, students also alluded to the frustration faced by the teacher when they do not understand, and to the fact that he sometimes leaves the classroom to calm down and come back in a better spirit.

The fact that the teacher is open about his own struggles and continually discusses with the students the importance of grit and perseverance has helped him to *promote a no-excuses culture in the classroom*. In the teachers' views such culture is promoted by not letting students justify their lack of effort in schoolwork due to personal struggles. For instance, he was emphatic to mention that the difficult family circumstances of the students should not impose a limitation for their learning:

> I worry about hunger but it does not mean that because they do not eat enough, they are not able to learn; of course it is harder, I am aware of that, and if we were able to solve that problem it would be much easier for the children to improve their learning, but that does not justify that they don't learn what they have to learn (…) so I always say, 'Don't use any excuse', not having money cannot become an excuse, having to travel to get to the school cannot become an excuse; education is essential and it is the only thing that will help them to get ahead.

In sum, the accounts suggest that although the teacher had set personal boundaries with the students, he cares deeply about their wellbeing, and is highly committed to their education. As a result, students respect him, obey his rules and respond positively to the no-excuses culture by exerting the effort necessary to master the material. This implies that the strict but cordial relationship between the teacher and the students translates into cognitive engagement.

1.4 Discipline

Informal observations, coupled with findings from the interviews suggest that there is a controlled environment in the classroom. In fact, the teacher mentioned that he works intensely in the discipline for the first two or three months of the school year to be able to 'work calmly' thereafter. The participants' accounts suggest that to maintain the discipline, the teacher *avoids having dead time during the lessons*,[151] *enforces rules by punishing misbehaviour*, and *cultivates harmonious relationships between students*.

Regarding the type of punishments imposed by the teacher, the students mentioned that more often the teacher would not let them go to recess and would scold them to let them know they should get to work; on more serious matters, the teacher calls in their mothers, and if necessary suspends them for a few days. However, the teacher asserted that

[151] Reflecting on how to avoid having dead time during the lessons, the teacher commented that it was key to know what to do with the pupils at all times, and that this is achieved by planning the lessons. For instance, he explained he prepares problems with higher difficulty for students who finish their work earlier, and asks advanced students to help classmates who are taking longer to finish their tasks.

punishing misbehaviour might not be the most effective strategy to reinforce rules, since students sometimes continue misbehaving despite the consequences. Therefore, he suggested that encouraging students, motivating them, letting them know when he is proud of their accomplishments, and making them aware of the problems they are causing their parents (who are already facing difficulties), had proved to be more effective in improving classroom discipline.

According to the teacher, other important factors influencing his ability to control the discipline, is that there are only 11 students in the classroom, and that students have tended to stay calm and composed through the year. In fact, he mentioned this has been an exceptional pool of students when compared with the discipline of pupils in previous years.

2. ACTIVITIES

As mentioned before, once the teacher practices promoting student engagement were studied, the second aim of the analysis was to identify practices not included in the econometric model, as well as individual characteristics and contextual factors that may be promoting student engagement and attainment. In order to achieve this objective, inductive analysis was conducted to examine the interview's data.

The findings suggest that a crucial factor influencing student engagement in this classroom was the fact that students were exposed to creative lessons, delivered by an enthusiastic teacher, where they had fun, built their curiosity and explored arts. The analysis also suggests the importance of parental involvement. The results are summarized below.

2.1 The teacher is highly enthusiastic about the classroom activities

Although the accounts revealed the teacher was strict and rigorous during the lessons, they also suggested he is an inspiring teacher, with high energy levels and charisma. At the classroom level, his enthusiasm has been translated into dynamic and exciting lessons. Analysis of the data revealed that the fact that *the teacher is extroverted, highly creative, trained in arts and engaged* has allowed him to deliver lessons where students feel engaged and stimulated.

The participants' accounts as well as informal field observations suggest that the teacher appears to be in total control of the lessons and to master their content. This confidence in his skills, and the belief in the importance of his work, has helped him to implement novel activities during the lessons without feeling intimidated. In this regard, the teacher commented: 'I am completely uninhibited, I'm not ashamed of anything (…) I am not ashamed of lying on the floor, singing, disguising myself, or whatever I have to do to capture their attention.'

In addition, the teacher stated that he was able to conduct exciting lessons because he was *creative*. According to him, being creative is extremely important in an environment where resources are scarce and access to materials and technology is limited. The teacher mentioned that in order for creativity to emerge, the teacher needs to be fully immersed in the planning of the lessons, researching for activities, and actively thinking about strategies to capture students' attention.

Discussing further on the importance of being *engaged while planning the lessons*, the teacher suggested that he devotes a great deal of time to developing ideas (he uses different activities to the ones suggested in the official book), and examining individual test results. According to the teacher these efforts result in presenting students with content that has been fully thought through and adapted to their needs.

Not surprisingly, given the teacher's commitment to student learning, when enquired about his motivation to go to work every day, he asserted that every day represents an opportunity to help students learn:

> These children do not have people outside school to teach them, so one of my motivations is to know that I have the abilities to make them learn, that it is my responsibility that they do not quit or fail in high school and that they end up knowing what a 6th-grade student should know.

The students overwhelmingly referred to the fact that the teacher was passionate about his role as a teacher and deeply engaged in their learning. The following comment summarizes the students' views:

> Estela: when we are going to do something he says it very motivated, he says we are going to make an effort, we have to do it, we are going to have fun, and then we feel motivated, we get in groups, we do things and do them well … (Antonia:) Teacher Sebastian is very energetic, I do not know what he has, but he makes you do things and enjoy doing them.

2.2 Classroom activities are exciting and fun

In order to understand why students seem to enjoy their time in the classroom, they were asked to reflect on classroom activities that were exciting, and on the teacher's attitudes they liked the most. As a result of this enquiry, 10 of the 11 students suggested that the majority of the classes were exciting as the teacher *made them laugh by including jokes as part of the explanations*, *captured their attention with tricks, theatrical representations and interesting facts*, and *included art activities in their daily routines*. In addition, they stressed that they were constantly excited about their art projects, especially the plays, dances and plastic art creations.

Regarding the use of tricks, the teacher explained that he uses this to energize the class, to make a point about the material being discussed, to get students attention, and in general to be in control of the lesson. Explaining the purpose of this practice the teacher asserted:

> It is important to have command of the class, that children observe you, that they pay attention, how do I get their attention? With mimics, with a magic trick, whatever helps me to explain better or simply to keep them attentive, that is basic because if not they wouldn't pay attention … That is what I do in all the subjects.

When asked to explain further about the moment during the lesson when he introduces these attention-holding strategies, the teacher asserted:

> I do it when I see that a child is absent-minded, at that moment I stop explaining and I do something to grab his attention … if one among the 11 is not attentive, I stop … I also do it when I start classes; I arrive, we talk about the subject that we are going to see and at that moment to grab their attention I do some of this silliness.

The participants were not short of examples illustrating how the use of tricks made the lesson more engaging. For instance, the teacher described a lesson when he used a spinning top in order to explain the earth's movement of rotation and revolution:

> I arrive with the spinning top and I start to do tricks with it, and the children immediately focus on what I'm doing, then I throw the question: Why does the spinning top stay still and not fall off? And they start to analyse that it is moving on its own axis and that when it stops spinning, it falls … and that's when I introduce the subject of earth movement, but notice that the single act of seeing the spinning top in motion leads them to understand the concept, and there is no need to talk.

This comment made by Sara helps to illustrate the importance of presenting students with this kind of activity:

> It is not exciting when the teacher explains to us in the way it is presented in the book, but he always tries to explain it differently, with things from real life, he gives us maths problems but the scenario is a market or a butcher shop, and he makes jokes and it's then when we have more fun. He assigns us problems related to food or he uses himself as an example … he has something that excites you because he explains things in a thousand fun ways until you understand it.

Furthermore, *the students spoke passionately about their art lessons* and in fact the majority of them mentioned art-related activities as the most exciting activities during the academic year.[152] Interestingly, low achievers described enthusiastically their art projects, which was not the case when they were asked about their projects in other subjects. The teacher's accounts revealed he considers art lessons to be a key component of his instruction, as they help nurture students' creativity, develop their sensitivity, improve their communication skills, and teach them discipline.[153]

The findings indicate that enthusiasm and engagement on the part of the teacher influence the behavioural and cognitive engagement of the students. This is the case as the teacher's confidence and enjoyment of the lessons influence positively the atmosphere and ethos of the classroom. This in turn makes the pupils' perception towards the assignments favourable and promotes students' willingness to participate. In addition, the fact that the lessons are delivered using creative strategies that increase students' curiosity and interest in the subjects, also favour student behavioural and cognitive engagement, as students are excited to participate, are looking forward to the class, and are more focused during class-time.

3. PARENTS ARE INVOLVED AND PLACE HIGH VALUE ON EDUCATION

In response to the question, 'What are the key factors influencing student learning?', the teacher mentions *that parents play a major role in the academic achievement of their*

[152] These activities included: learning to play the flute and the bongo, creating sculptures and making presentations to explain their meaning to their classmates, drawing realistic pictures, learning a song in Zapotec (an indigenous Mesoamerican language) and singing it to their parents during a family event while the teacher was playing the guitar, preparing and presenting dances during school events, and improvising theatre plays during lessons.

[153] According to the teacher, the fact that *he underwent formal training in music and has experience teaching music and dance* has helped him make lessons more interesting for the students, as he integrates arts (i.e. theatre, plastics arts, dance and music) into the curriculum of all subjects.

children. He explained that 'a child who is with his parents and who receives their help, is a child who moves faster than a child who is not helped at home; good students usually have committed parents.' The teacher also commented that high achievers in the classroom are at the same time the children of the most engaged mothers.

However, the teacher acknowledged that *parents' cooperation is somehow limited to providing emotional support*, as most of the time parents in the community are not qualified to support them academically:

> When I talk about the importance of parental support, I refer to motivation and not to the academic part, because when students are already in 6th grade, their parents do not know how to help them anymore; at that point children already know more than many parents … but I think that motivation is important.[154]

The teacher pointed out that although not all parents were committed to the education of their children, the majority of them were. Specifically, he stated that four of the eleven mothers were constantly asking him about their children's performance and were fully committed to their education, while another three mothers were to some extent involved, leaving four students in the classroom with no or little support from their parents.[155]

In line with the teacher's perception, six students in the classroom mentioned *they were motivated to attend school and to do well, due to their parents*. When asked to explain further, all of them emphasized that their parents were making great sacrifices in order for them to attend school and therefore they had a moral commitment to them.[156] The following comment summarizes the beliefs of the students who commented on parental support:

> Sara: My parents are my biggest motivation to come to school. I have parents who support me in all aspects and who want me to finish my studies; in fact my dad

[154] For instance, the teacher mentioned parents are particularly good at encouraging academic participation, as students are very rarely absent from school.

[155] During the fieldwork, I observed some behaviours that corroborate the idea that the majority of the parents in the classroom were involved in the education of their children. These include: the mothers of the 11 students were able to attend the Mothers' Day celebration; some of the mothers were able to act as caretakers during an entire school day, when the teacher was unable to attend school; the mothers often return to the school in the afternoon, so their children could ask questions to the teacher about the homework or discuss difficulties they were having with their projects; six students stated that their parents wanted them to go to the secondary school located in the nearby village, which is known to provide better educational services than the *telesecundaria* located in their community. The *telesecundaria* is a distance education programme that delivers content through closed-circuit television and on-site teacher tutoring.

[156] Although tuition is free in public schools in Mexico, parents still face the challenges of meeting the cost of class materials, uniforms, food, and most importantly the cost associated with a decrease in the income from child labour earnings.

told me that in the event he does not have money, he will try to get some as long as I finish my studies; sometimes I think about the effort they make and on the harsh blow it would be for them if I ever told them that I don't want to come to school again.

Table 6.1. Summary of enablers and challenges for student engagement in school two.

Enablers for engagement at the classroom and individual level: Engagement is understood as having a cognitive component
1. TEACHER PRACTICES
1.1 Academic Press
1.1.1 This class really makes me think and I feel challenged
1.1.2 My teacher expects that I do my best all the time, and that everyone works hard
1.1.3 I have to work hard to do well
1.1.4 My teacher wants us to become better thinkers, not just memorize things
1.2 Academic Personalism
1.2.1 My teacher notices if I have trouble learning something
1.2.2 My teacher helps me catch up if I am behind
1.3 Trust
1.3.1 My teacher treats me with respect
1.3.2 My teacher sets personal boundaries*
1.3.3 My teacher is honest with me*
1.4 Discipline
1.4.1 My classmates do behave the way my teacher wants them to
2. ACTIVITIES*
2.1 The teacher is highly enthusiastic about the classroom activities
2.2 Classroom activities are exciting and fun
3. PARENTS ARE INVOLVED AND PLACE HIGH VALUE ON EDUCATION*
Challenges for engagement at the classroom and individual level
1. TEACHER'S LACK OF ENTHUSIASM*
2. DIFFICULT SOCIOECONOMIC BACKGROUND AND LACK OF INCENTIVES*

* Themes that emerged from the data using inductive analysis.

The teacher's accounts coupled with informal observations indicate that at least six of the eleven mothers spend a considerable amount of time with their children, take care of them, provide motivational support, and value education, all of which seem to translate into student participation. Furthermore, the accounts indicate that cognitive engagement emerges from the fact that children feel the responsibility to compensate for their parents' efforts by working hard in school, and also from their willingness to provide a better future for themselves and their parents. Table 6.1 summarizes the enablers and challenges for student engagement in school CO8304.

Challenges for engagement at the classroom and individual level

Although the findings revealed several practices and activities that lead to student engagement in this classroom, the analysis also revealed factors that undermined the students' ability to become engaged. Specifically, the accounts indicate that the lack of teacher enthusiasm during one of the classes, and the burden imposed by having low socioeconomic backgrounds diminish the students' ability to participate in school. Similarly to the results about *activities*, the findings summarized below are the result of conducting inductive analysis.

1. TEACHER'S LACK OF ENTHUSIASM

As is evident from the analysis presented above, the teacher is highly committed to student learning, has confidence in his teaching ability, and is enthusiastic during the lessons. However, according to the teacher's accounts, contrary to his experience in all other subjects, during the History class he has difficulties enjoying the lessons and engaging the students. When asked to explain further, the teacher stated that this is the consequence of his lack of enthusiasm for this subject, which he considers irrelevant. The following response, provided by the teacher when asked about the subjects in which it was difficult to engage students, helps to understand his views in this regard:

> Definitely History. (Why?) I see no sense in this subject … I understand that the objective is that we do not make the same mistakes of the past, but it does not fit me because as human beings we are wrong a thousand times and we repeat the same mistakes, right? Then I do not think it's relevant and that's why it is so hard for me to teach them … and it does not mean that I have not made the same or even more effort to teach them than in other subjects; you can check their notebooks, we have tried with synoptic charts, concept maps … and nothing works … but if I am honest with you, I believe I have passed my apathy for History on to them. (How?) Well I tell them: 'Here we go with History again!' They know I do not like it and maybe that's why they think it's difficult.

All students agreed with the fact that they dislike this subject. In general, the students suggested that during this class, they feel bored, tired, they misbehave and they are inattentive. However, when they were asked if what they learn in the History class was important, the majority disagreed with the teacher, and stated that all subjects were important, including History. When enquired about the reasons why they did not like the class, the students commented emphatically that the class was tedious as the activities

were limited to summarizing the content found in the book, but most importantly, because the teacher do not often perform the fun activities he usually used in the other classes.

In sum, data from the interviews revealed the importance of providing students with an active experience during the lesson, where they have the opportunity to participate and apply their understanding. However, the most remarkable finding is that even highly effective and engaging teachers can have a negative attitude that may affect the students' learning during the lesson. Specifically, the analysis pointed to the importance of maintaining a sense of purpose, excitement, enjoyment, control of the lesson and self-efficacy despite the personal beliefs of the teacher towards the subject.

2. DIFFICULT SOCIOECONOMIC BACKGROUND AND LACK OF INCENTIVES

Analysis of the data revealed that in addition to the barriers at the classroom level, contextual factors also influence student disengagement. Specifically, the analysis suggests that the burden imposed by having a low socioeconomic background affects both the student's ability to participate in school, and the teacher's effort to provide an effective instruction. For instance, the teacher commented that if it were possible to provide students with adequate food to avoid malnutrition, and mitigate the effects of living in single-parent families facing economic distress, it would be much easier for the pupils to improve their learning.

Interestingly, the fact that students live in a highly isolated community also places a burden for instruction, as some of the students are extremely shy, given that they are not frequently exposed to people outside their community or encouraged to express their opinion. The inability of the students to communicate effectively has profound effects on the quality of the instruction, as it prevents students from participating and engaging in discussions.[157]

In addition to the limitations imposed by the environment, the lack of incentives faced by the teacher also contributes to make his work at the classroom exceptionally

[157] The teacher noticed that students who went more often to the capital of the state and therefore were exposed to experiences and individuals outside the community, were more able to express their ideas and relate to their peers.

demanding.[158] For instance, although the teacher serves as both the 6th-grade teacher and the principal of the school, he only receives the salary for being the 6th-grade teacher. This is the case, as in the multi-grade scheme principals are provisional head teachers, which means that they are only temporarily in charge of the position. However, the teacher has been a provisional head teacher for the last five years.[159] As a consequence, the teacher (as many teachers in the country) has a second job during the afternoon.

Furthermore, given the multi-grade structure of the school, the teacher is not able to receive much assistance and support when challenged with difficulties. For instance, in the case of unforeseen or even foreseen absences, there are no replacement teachers. This was evident during the fieldwork as the teacher was unable to attend school, and the students (with the guidance of the teacher) were then in charge of delivering the lessons while a mother acted as a caretaker.

In addition, the teacher also faces lack of motivational incentives derived from the uncertainty about the academic future of his students. Specifically, the teacher commented that based on his experience, even though his students finished primary school with the required qualifications, when they start their first year of secondary education they might be in a classroom with students who cannot perform basic operations such as addition and subtraction, which prevents them from advancing in the regular curriculum. Equally important, he mentioned that some of his most hardworking students during primary school where not able to finish secondary education due to teenage pregnancy or economic hardship.

In sum, findings from the analysis suggest that although the individual characteristics of the teacher, such as charisma and self-efficacy, are crucial to engage students in this classroom, other contextual factors, such as lack of incentives for the teacher, and the disadvantaged background of the students, also have a great influence on the teacher's ability to engage students. These results pointed to the relevance of issues of major importance, such as malnutrition and teenage pregnancy, to improve the ability of the teacher to contribute to student achievement growth.

[158] These circumstances are in fact not unusual for school staff working in highly isolated and impoverished areas in Mexico.
[159] This was also the case for one of the 6th-grade teachers in other schools in the sample, which may indicate that this is not an unusual occurrence.

CONCLUSION

This chapter explored the teacher practices, individual characteristics and contextual factors that promote the relative high levels of cognitive, behavioural and emotional engagement among 6th-graders. According to the quantitative analysis, it would be expected that the teacher practices *clarity*, *academic press*, *trust*, *academic personalism*, and *rigour*, were relevant to the engagement of students in the classroom.

The qualitative analysis revealed that *academic press*, *academic personalism*, and *trust*, were in fact key practices promoting student engagement in this classroom. The results indicate that engagement emerges mainly from the *academic press* exerted by the teacher, that is, from the high expectations he holds for student performance and from the pressure for high standards of achievement. However, the complexities of the construct were evident as participants noted that *academic press* and *academic personalism* interact to provide an environment in which pupils can achieve at a high level.

The evidence from this classroom suggests that this could be the case, as in the absence of adequate support, students might not be able to respond successfully to the teacher's demands and thus become disengaged. Even though the results from the quantitative analysis show that *academic personalism* is only correlated with cognitive engagement (r=0.15), the accounts suggest that it also promotes behavioural engagement, as students reported they participate more and spent more time mastering the course material when the teacher provided personalized support.

Although the quantitative analysis indicated that *trust* is positively correlated with the emotional engagement of the students (r=0.15), analysis from the interviews revealed that this might not be the case in this classroom, as the relationship between the teacher and the students does not seem to determine the *identification* of the students with the school (i.e. emotional engagement), but the students' level of *investment in learning* (i.e. cognitive engagement). The participants noted that the rapport the teacher built with the students, while maintaining personal boundaries and caring deeply about student success in school, was important in promoting the students' willingness to obey the rules and respond positively to the no-excuses culture.

The results from the quantitative analysis found no evidence of a significant correlation between *discipline* and any type of engagement. However, the qualitative analysis

indicates that the teacher has an effective classroom management strategy in place, which influences the behavioural engagement of the students. Although *clarity* did not emerge as a prominent factor influencing student engagement, as it was not a topic the participants discussed on its own, the accounts suggest that students receive clear learning goals and instruction.

In addition to the teacher practices, the analysis pointed out that the enthusiasm of the teacher during the classroom activities, and the fact the activities were exciting, interesting and fun, contributed to student engagement in this classroom. Parental involvement was also found to promote student engagement. Contrarily, the difficult socioeconomic background of the students and the lack of incentives faced by the teacher, were reported by the participant as limitations to the teacher's ability to engage students.

Although the analysis indicates the teacher delivers lessons where students feel engaged and stimulated most of the time, the students reported to be disengaged in the History class. According to the students this was the case as activities in this class were repetitive and tedious. The accounts revealed that the teacher believes this subject is irrelevant and therefore does not exhibit the same enthusiasm as in the other classes, or conduct the same activities. This finding is particularly important because it indicates that even highly effective teachers might struggle to engage students in all subjects, and highlights the importance of the teacher's attitudes during instruction.

Even though the teacher is able to engage the majority of the students, there were still two pupils in the classroom who struggle to attain better educational outcomes. Although these students are usually disciplined, they are apathetic, less willing to exert effort in the academic tasks than their peers, and have low self-belief. The participants noted that the fact that these pupils are not able to focus in school could be related to the fact that they are deprived of basic needs and face adverse family circumstances. This finding is relevant as it indicates that receiving adequate support from parents or caregivers could help the students to take advantage of the knowledge and experiences offered by an exceptional teacher.

Finally, the results suggest that the teacher in this classroom promotes engagement and helps students achieve at a high level, in the absence of a formal principal and even in the absence of a learning community where he can receive support and feedback that help

him to improve the instruction. The evidence also suggests that students are engaged in learning in the absence of technology, or the most basic materials and resources.

CHAPTER 7: DISCUSSION

Supporting the theoretical proposition of the research, I found that schools in the state of Hidalgo had high levels of engagement and achievement despite serving students in disadvantaged circumstances. Results from the case studies revealed that engagement in these schools is a key determinant of student learning, and evidence from the quantitative and qualitative analysis indicates that teacher practices, leadership, and parental support facilitate such student engagement.

Findings from the qualitative analysis provide evidence that there are quite different ways through which schools engage students: some schools prioritized one type of the engagement over the others (i.e. school CO8304 prioritizes cognitive engagement over emotional and behavioural engagement, and school AI2440 prioritizes emotional engagement). Even though this was the case, the analysis also revealed that in this sample of high achieving schools all schools engaged students cognitively, behaviourally and emotionally to some extent, as shown by the positive correlation between the three types of engagement.

Analysis from both quantitative and qualitative data brought to light the key practices that were promoting engagement in the selected schools. Although these practices are relevant across schools, teachers use them to varying degrees depending on the type of engagement they prioritize. Specifically, I found strong evidence from the quantitative analysis and the two case studies on the importance of the teacher being aware of the students' academic needs and providing students with the support they need to achieve academic goals (i.e. academic personalism). The data was particularly clear in pointing out the importance of this practice to promote cognitive and behavioural engagement. Results from the quantitative analysis and school CO8304 in particular also suggest that experiencing a normative emphasis on academic success and conformity to specific standards of achievement (i.e. academic press) is a key factor promoting cognitive engagement.

Having a positive relationship with the students (i.e. trust) was also found to be positively correlated with student engagement. However, analysis of qualitative data revealed that teachers approach differently their relationship with students. In school AI2440 (where trust is of great importance for the teacher), the students and the teacher recognize each

other as friends, and students perceived they were protected and cared for by the teacher. In school CO8304, the teacher and the students had an academic relationship, where the teacher set personal boundaries while caring deeply about the students' success in school. Despite the different approaches, having a positive relationship with the students helped both teachers to promote not only their emotional engagement (as suggested by the quantitative analysis), but also their cognitive and behavioural engagement.

Providing clear learning goals and clear instruction did not emerge as a relevant practice in the qualitative analysis. However, results from the econometric analysis showed that from all the variables included in the model, clarity had the highest correlation with cognitive and behavioural engagement. The fact that clarity was not relevant in the case studies could be the result of only having studied two schools (where clarity happened to be emphasized less), or that teachers (who responded to the interview) and the students (who responded to the survey) have different perspectives about this construct.

The practice of pupil discipline was not found to be correlated to any type of engagement in the quantitative analysis. However, using data from the case studies, I found that the strategies implemented to control the classroom favour the behavioural engagement of the students. Both teachers in the case studies have successful classroom management strategies in place, and consider discipline as a key practice without which they would not be effective.

In addition to the teachers' practices, inductive analysis revealed the importance of teacher characteristics to promote student engagement. Analysis from both case studies suggests that the teachers' creativity (which derived in stimulating activities), enthusiasm, self-efficacy, subject knowledge, and the amount of time and effort invested in planning the lessons, were key factors boosting the teachers' ability to engage students cognitively and behaviourally.

These findings indicate that in the selected schools, teachers employ a repertoire of practices that coupled with their personal characteristics, promote student engagement. This idea is illuminating considering the focus of the educational motivation literature on single mechanisms implemented by teachers to engage students. The evidence also suggests that, in line with the theoretical understanding of engagement as a metaconstruct, students were cognitively, behaviourally and/or emotionally engaged to some extent, and that each of the practices summarized above promoted at least one type of engagement.

In addition to the findings on teacher practices, the analysis revealed that the principal was playing a vital role in promoting student engagement. In line with the literature on school leadership, evidence from school AI2440 (which has a full-time principal) suggested that the role of the head teacher was largely mediated through the teacher and organizational factors. I found evidence of three strategies implemented by the principal that promote student engagement in this school.

First, the head teacher monitors and evaluates the teacher practices. By doing so she is able to identify aspects such as difficulties with classroom management and pedagogical approaches, and provide feedback to the teacher, which seems to be promoting better teacher practices. Monitoring teacher performance also allows the principal to motivate the teacher while pressing for results.

Second, the head teacher supports a collaborative work culture by leading a learning community where all staff members seem to take collective responsibility for students' learning and wellbeing. The participants noted that the existence of such a community is possible due to the ability of the principal to promote harmonious relationships among staff members. The evidence suggests that student engagement seems to be the result of the efforts made by staff members in all grade levels, and during an extended period of time. The teamwork between USAER and the teacher (facilitated by the principal) was found to be of particular importance to ensure students were receiving adequate academic personalism from their teacher and from a team of specialists.

Third, the principal implements innovative strategies to generate and use school resources. The exceptional availability of resources in the school seems to be related to the principal's ability to exercise leadership beyond the school. Specifically, the head teacher creates partnerships with a network of allies that ranged from the private sector to other principals and the government, which had allowed her to have knowledge about sources of funding, and apply for resources that are available.

Having access to a fully-equipped library, didactic materials and technology, being exposed to a warm and inviting environment, and being able to participate in activities such as trips, was found to promote not only the behavioural engagement of the students (as suggested by the quantitative analysis) but also their cognitive engagement. The resources in the school seem to be aligned with the pedagogical purposes of the school and help to focus school activities on improving learning. These results indicate that

although serving students in a marginal locality, it was possible for school AI2440 to secure sufficient resources to create an environment that promotes learning.

Results from school CO8304 indicate that the teacher was able to engage students in the absence of a full-time principal, and therefore without the adequate support and resources. The evidence suggests that aside from implementing the teacher practices described above, presenting students with creative activities that have been fully thought through and adapted to students' needs was crucial in an environment where resources were scarce and access to materials and technology limited.

The teacher noted these innovative activities were the result of being fully emerged in the lesson planning, researching different activities than the ones suggested in the official book, and actively thinking about strategies to capture students' attention. According to the participants, these activities, which were used to introduce and explore content in all subject areas, were fun, challenging and build students' curiosity. Examples of these activities include the construction of imaginative creations to prove understanding of concepts, and art projects and performances.

Although the results presented above cannot be generalized, given the non-representative selection of schools and the very limited number of case studies, the effectiveness of the schools in the case studies in engaging their students, suggests that their practices (which are aligned with the theory and with the results from the quantitative analysis) can be used as models for other schools. This research is therefore relevant for primary school teachers in general but especially those who oversee classes with low engagement who might benefit from receiving in-service training on the practices shown in this research to improve the engagement level of their students.

The findings from school AI2440 highlighting the crucial contribution of the principal are illuminating as they indicate that training in schools with complete organization schemes should also focus on principals, who can benefit from receiving training on how to support teacher practices and on the implementation of management strategies that promote student engagement.

Findings from school CO8304 showing that practices as crucial as academic press, trust and discipline resulted mainly from the teacher's individual effort, indicate that teachers can engage their students even without support from principals or other staff members.

Teacher training in both types of schools should also focus on the development of positive attitudes towards teaching (such as being an enthusiastic teacher) and emphasize the role of effort attributions over ability attributions.

In addition the findings may also inform policy in three major aspects. First, this research presents evidence that even in marginal localities with populations living in challenging circumstances, it was possible to find schools which had high levels of achievement and engagement and it was possible to identify the key teacher practices that seemed to be producing the positive results in these schools. Second, the link between student engagement and achievement, suggested by the literature and corroborated in this research, points to the importance of collecting data on the three types of engagement studied. Third, the assistance provided by USAER in an environment that values individual support to students seems to be key to improve student engagement.

In addition to the school-level variables mentioned above, parental inputs and student family background were found to be critical factors determining student engagement in the selected schools. The findings from the quantitative analysis revealed a positive correlation between the emotional and developmental support from parents and cognitive and behavioural engagement. In line with these findings, results from the qualitative analysis suggest that students who received motivational support from their parents, and who had parents that were involved and placed high value in their education, were more cognitively and behaviourally engaged. High achievers in the case studies were at the same time the children of the most involved mothers.

The results also revealed that poor parental education was a limitation for student engagement in these schools. The results suggest that low-skilled parents seem to be unable to assist their children with schoolwork; to support at home the school initiatives aiming to improve learning; and to provide cognitive stimulation. Moreover, the findings are clear in pointing out that the burden imposed by having low socioeconomic background (which manifest in deprivation of basic needs, exposure to difficult home environments, and distress associated with lack of financial resources) limits the student's ability to participate in school, and the teacher's efforts to provide an effective instruction.

In addition, there appears to be differences in the way that schools interact with families between the two case studies. In school AI2440, the teacher makes deliberate efforts to motivate and engage parents (e.g. involving them in the learning process of their children

throughout the year, and fostering better parenting ability). On the contrary, in school CO8304, the teacher (based on difficult experiences with parents at the beginning of his career) took the deliberate decision not to involve parents in the learning process of their children (e.g. not relying on parents to assist children with schoolwork or to press them with high standards of achievement). The evidence also suggests that irrespective of the role teachers consider parents must play in the education of their children, none of the teachers rely on family expectations and instead hold high expectation for what children can achieve.

Finally, the research indicates three areas where further research can be informative. First, the majority of the schools at the top of the value-added ranking were clustered in a very specific geographical area in the north part of the state called La Huasteca (specifically, in the municipalities Huejutla de Reyes, Lolotla, Tianguistengo, Huazalingo, Atlapexco, Tlanchinol and Molango de Escamilla), and therefore it would be important to study the factors promoting the positive results of the schools in this area.

Second, students in both case studies agree that they were disengaged in the History class. Although the research indicates that in one of the schools the teacher's negative perceptions about the relevance of this subject could be related with this finding, it would be important to investigate whether this is the case in other schools, what factors could be influencing student disengagement (e.g. pedagogy or subject content), and if disengagement in the History class corresponds with low scores in this subject.

Third, in line with the literature, the results indicate that parents are key in determining pupil outcomes; for this reason it seems crucial to investigate if and how the interaction between the school and the parents in disadvantaged areas, can promote higher levels of student engagement. This considers the evidence suggesting that teachers in the case studies approach differently their interaction with parents, and that such interaction might be related to the students' ability to engage in learning.

REFERENCES

Alexander, K. L., Entwisle, D. R., & Dauber, S. L. (1993). First-grade classroom behavior: its short- and long-term consequences for school performance. *Child Development*, 64(3), 801–814.

Allensworth, E. M., Gwynne, J. A., Pareja, A. S., Sebastian, J., & Stevens, W. D. (2014). *Free to fail or on-track to college. Setting the stage for academic challenge: classroom control and student support*. Chicago: University of Chicago Consortium on Chicago School Research.

Anderson, C. S. (1982). The search for school climate: a review of the research. *Review of Educational Research*, 52(3), 368–420.

Anderson, A. R., Christenson, S. L., Sinclair, M. F., & Lehr, C. A. (2004). Check & connect: the importance of relationships for promoting engagement with school. *Journal of School Psychology*, 42(2), 95–113.

Appleton, J. J. (2012). Systems consultation: developing the assessment-to-intervention link with the student engagement instrument. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 725–741). New York: Springer.

Appleton, J. J., Christenson, S. L., Kim, D., & Reschly, A. L. (2006). Measuring cognitive and psychological engagement: validation of the student engagement instrument. *Journal of School Psychology*, 44(5), 427–445.

Attwell, A. A., Orpet, R. R., & Meyers, C. E. (1967). Kindergarten behavior ratings as predictors of academic achievement. *Journal of School Psychology*, 6(1), 43–46.

Baines, E. (2013). Ability grouping. In J. Hattie, & E. Anderman (Eds.), *International guide to student achievement* (pp. 116–119). New York: Routledge.

Balch, R. T. (2012). *The validation of a student survey on teacher practice* [PhD Thesis]. Vanderbilt University.

Balfanz, R., Herzog, L., & Iver, D. J. M. (2007). Preventing student disengagement and keeping students on the graduation path in urban middle-grades schools: early identification and effective interventions. *Educational Psychologist*, 42(4), 223–235.

Bandura, A. (1997). *Self-efficacy: the exercise of control*. New York: Freeman.

Barron, B., & Darling-Hammond, L. (2010). Prospects and challenges for inquiry-based approaches to learning. In H. Dumont, D. Istance, & F. Benavides (Eds.), *The nature of learning: using research to inspire practice* (pp. 199–226). Paris: OECD Publishing.

Bell, L., Bolam, R., & Cubillo, L. (2003). A systematic review of the impact of school leadership and management on student outcomes. In *Research evidence in education library*. London: EPPI-Centre, Social Science Research Unit, Institute of Education, University of London.

Bill & Melinda Gates Foundation. (2012). *Asking students about teaching: student perception surveys and their implementation*. Seattle: Bill & Melinda Gates Foundation.

Bingham, G. E., & Okagaki, L. (2012). Ethnicity and student engagement. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 65–95). New York: Springer.

Birch, S., & Ladd, G. (1997). The teacher–child relationship and children's early school adjustment. *Journal of School Psychology*, 35(1), 61–79.

Blakemore, S. J., & Robbins, T. W. (2012). Decision-making in the adolescent brain. *Nature Neuroscience*, 15(9), 1184–1191.

Blanchard, S., Freiman V., & Lirrete-Pitre, N. (2010). Strategies used by elementary schoolchildren solving robotics-based complex tasks: innovative potential of technology. *Procedia Social and Behavioral Sciences*, 2(2), 2851–2857.

Blanco, E. (2008). Factores escolares asociados a los aprendizajes en la educación primaria mexicana: un análisis multinivel. *Revista Electrónica Iberoamericana sobre Calidad, Eficacia y Cambio en Educación*, 6(1), 58–84.

Blumenfeld, P., & Meece, J. L. (1988). Task factors, teacher behavior, and students' involvement and use of learning strategies in science. *The Elementary School Journal*, 88(3), 235–250.

Blumenfeld, P. C., Mergendoller, J. R., & Puro, P. (1992). Translating motivation into thoughtfulness. In H. H. Marshall (Ed.), *Redefining school learning* (pp. 207–239). Norwood: Ablex.

Bohn, C. M., Roehrig, A. D., & Pressley, M. (2004). The first days of school in the classrooms of two more effective and four less effective primary-grade teachers. *Elementary School Journal*, 104(4), 271–287.

Booker, K. C. (2004). Exploring school belonging and academic achievement in African American adolescents. *Curriculum and Teaching Dialogue*, 6(2), 131–143.

Brophy, J., & Good, T. (1986). Teacher behavior and student achievement. In M. Wittrock (Ed.), *Handbook of research on teaching* (pp. 328–375). New York: Macmillan.

Bruns, B., & Luque, J. (2014). *Great teachers: how to raise student learning in Latin America and the Caribbean*. Washington: The World Bank.

Bundick, M. J. (2011). *Scale validation of the iKnow My Class Survey*. Portland: ME Quaglia Institute for Student Aspirations.

Burniske, J., & Meibaum, D. (2012). *The use of student perceptual data as a measure of teaching effectiveness*. Austin: SEDL Texas Comprehensive Center.

Burns, J. M. (1978). *Leadership*. New York: Harper & Row.

Cabrera-Hernandez, F. (2015). *Does lengthening the school day increase students' academic achievement? Evidence from a natural experiment*. Available at: http://econpapers.repec.org/paper/sussusewp/7415.htm. Working Paper No. 74-2015. Department of Economics, University of Sussex.

Carnoy, M., Gove, A. K., & Marshall, J. H. (2007). *Cuba's academic advantage: why students in Cuba do better in school*. Palo Alto: Stanford University Press.

Caso, J., Chaparro, A., Díaz, C., & Urias, E. (2012). *Propiedades psicométricas de las escalas, cuestionarios e inventarios de la estrategia evaluativa integral 2011: factores asociados al aprendizaje*. Reporte técnico UEE RT 12 002. Enseñada: Universidad Autónoma de Baja California.

Cassen, R., McNally, S., & Vignoles, A. (2015). *Making a difference in education: what the evidence says*. Abingdon: Routledge.

Cervini, R. (2004). *Factores asociados al aprendizaje del lenguaje y las matemáticas en 13 estados de México – 3o y 4o grados en educación básica*. México: Instituto Nacional para la Evaluación de la Educación (INEE).

Chetty, R., Friedman, J. N., & Rockoff, J. E. (2014). Measuring the impacts of teachers I: evaluating bias in teacher value-added estimates. *American Economic Review*, 104(9), 2593–2632.

Christenson, S. (2009). The relevance of engagement for students at-risk of educational failure: findings and lessons from check & connect research. In J. Morton (Ed.), *Engaging young people in learning: why does it matter and what can we do? Conference proceedings* (pp. 36–84). Wellington: NZCER Press.

Christenson, S. L., Reschly, A. L., & Wylie, C. (2012). Preface. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. v–ix). New York: Springer.

Clark, R. M. (1983). *Family life and school achievement*. Chicago: University of Chicago Press.

Clarke, P., Crawford, C., Steele, F., & Vignoles, A. (2010). *The choice between fixed and random effects models: some considerations for educational research*. DoQSS Working Papers, 10–10. Department of Quantitative Social Science, Institute of Education, University of London.

Clotfelter, C. T., Ladd, H., & Vigdor, J. (2006). Teacher–student matching and the assessment of teacher effectiveness. *Journal of Human Resources*, 41(4), 778–820.

Cobb, J. A. (1972). Relationship of discrete classroom behaviors to fourth-grade academic achievement. *Journal of Educational Psychology*, 63(1), 74–80.

Cohen, L., Manion, L., & Morrison, K. (2011). *Research methods in education* (7th ed.). London: Routledge Falmer.

Cohen, J., McCabe, L., Michelli, N. M., & Pickeral, T. (2009). School climate: research, policy, teacher education and practice. *Teachers College Record*, 111(1), 180–213.

Connell, J. P., Spencer, M. B., & Aber, J. L. (1994). Educational risk and resilience in African-American youth: context, self, action, and outcomes in school. *Child Development*, 65(2), 493–506.

Connell, J. P., & Wellborn, J. G. (1991). Competence autonomy and relatedness: a motivational analysis of self-system processes. In M. R. Gunnar, & L. A. Sroufe (Eds.), *Self processes in development: Minnesota symposium on child psychology* (pp. 43–77). Chicago: Chicago University Press.

Corno, L., & Mandinach, E. (1983). The role of cognitive engagement in classroom learning and motivation. *Educational Psychologist*, 18(2), 88–108.

Crawford, M. (2014). *Developing as an educational leader and manager*. London: Sage.

Creswell, J. W. (2009). *Research design: qualitative, quantitative, and mixed methods approaches* (3rd ed.). Los Angeles: Sage.

Creswell, J. W. (2014). *Research design: qualitative, quantitative, and mixed methods approaches* (4th ed.). Los Angeles: Sage.

Currie, C. E., Elton, R. A., Todd, J., & Platt, S. (1997). Indicators of socioeconomic status for adolescents: the WHO health behaviour in school-aged children survey. *Health Education Research*, 12(3), 385–397.

Darling-Hammond, L., Ancess, J., & Ort, S. (2002). Reinventing high school: outcomes of the coalition campus schools project. *American Educational Research Journal*, 39(3), 639–673.

Darr, C. W. (2012). Measuring student engagement: the development of a scale for formative use. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 707–723). New York: Springer.

Darr, C., Ferral, H., & Stephanou, A. (2008). The development of a scale to measure student engagement. Paper presented at the *Third International Rasch Measurement* conference, Perth, WA.

Davis, M. H., & McPartland, J. (2012). High school reform and student engagement. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 515–539). New York: Springer.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behaviour*. New York: Plenum.

Decker, D. M., Dona, D. P., & Christenson, S. L. (2007). Behaviorally at-risk African American students: the importance of student–teacher relationships for student outcomes. *Journal of School Psychology*, 45(1), 83–109.

Dee, T. S., & West, M. R. (2011). The non-cognitive returns to class size. *Educational Evaluation and Policy Analysis*, 33(1), 23–46.

Department for Education. (2011). *Class size and education in England: evidence report*. Research Report DFE-RR169. London: DfE.

Dolezal, S., Welsh, L., Pressley, M., & Vincent, M. (2003). How nine third-grade teachers motivate student academic engagement. *The Elementary School Journal*, 103(3), 239–267.

Doyle, W. (1978). Paradigms for research on teacher effectiveness. In L. S. Shulman (Ed.), *Review of research in education* (pp. 163–198). Itasca: F. E. Peacock.

Duckworth, K., Akerman, R., MacGregor, A., Salter, E., & Vorhaus, J. (2009). *Self-regulated learning: a literature review*. London: Centre for Research on the Wider Benefits of Learning.

Eccles, J. S., Midgley, C., Wigfield, A., Buchanan, C. M., Reuman, D., Flanagan, C., & Mac Iver, D. (1993). Development during adolescence: the impact of stage-environment fit on young adolescents' experiences in schools and in families. *American Psychologist*, 48(2), 90–201.

Emmer, E., Sabornie, E., Evertson, C. M., & Weinstein, C. S. (Eds.) (2013). *Handbook of classroom management: research, practice, and contemporary issues*. New York: Routledge.

Entwisle, D. R., & Astone, N. M. (1994). Some practical guidelines for measuring youth's race/ethnicity and socioeconomic status. *Child Development*, 65(6), 1521–1540.

Farrington, C. A., Roderick, M., Allensworth, E., Nagaoka, J., Keyes, T. S., Johnson, D., & Beechum, N. O. (2012). *Teaching adolescents to become learners: the role of noncognitive factors in shaping school performance*. Chicago: University of Chicago Consortium on Chicago School Research.

Fernandes, M., & Ferraz, C. (2014). Conhecimento ou práticas pedagógicas? medindo os efeitos da qualidade dos professores no desempenho dos alunos. Manuscript, PUC-Rio, Rio de Janeiro.

Finn, J. D. (1989). Withdrawing from school. *Review of Educational Research*, 59(2), 117–142.

Finn, J. D. (2006). *The adult lives of at-risk students: the roles of attainment and engagement in high school*. Washington: US Department of Education, National Center for Educational Statistics.

Finn J. D., Pannozzo, G. M., &Voelkl, K. E. (1995). Disruptive and inattentive-withdrawn behavior and achievement among fourth graders. *Elementary School Journal*, 95(5), 421–454.

Finn, J. D., & Rock, D. A. (1997). Academic success among students at risk for school failure. *Journal of Applied Psychology*, 82(2), 221–234.

Finn, J., & Servoss, T. (2014). Misbehavior, suspensions, and security measures in high school: racial/ethnic and gender differences. *Journal of Applied Research on Children: Informing Policy for Children at Risk*, 5(2), Article 11.

Finn, J. D., & Zimmer, K. S. (2012). Student engagement: what is it? why does it matter? In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 97–132). New York: Springer.

Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: potential of the concept, state of the evidence. *Review of Educational Research*, 74(1), 59–109.

Fredricks, J. A., & McColskey, W. (2012). The measurement of student engagement: a comparative analysis of various methods and student self-report instruments. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 763–782). New York: Springer.

Furrer, C., & Skinner, E. (2003). Sense of relatedness as a factor in children's academic engagement and performance. *Journal of Educational Psychology*, 95(1), 148–162.

Furtak, E. M., Seidel, T., Iverson, H., & Briggs, D. C. (2012). Experimental and quasi-experimental studies of inquiry-based science teaching a meta-analysis. *Review of Educational Research*, 82(3), 300–329.

Garcia, S., Maldonado, D., Perry, G., Rodriguez, C., & Saavedra, J. (2014). *Tras la excelencia docente: cómo mejorar la calidad de la educación para todos los colombianos*. Bogota: Fundacion Compartir.

García, J. M., & Martínez, S. (2013). Leadership responsibilities and dispositions of principals in successful schools in Mexico. In C. L. Slater, & S. W. Nelson (Eds.), *Understanding the principalship: an international guide to principal preparation* (pp. 197–221). Bingley: Emerald Group Publishing Limited.

Gettinger, M., & Walter, M. J. (2012). Classroom strategies to enhance academic engaged time. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 653–673). New York: Springer.

Gezi, K. (1990). The role of leadership in inner-city schools. *Educational Research Quarterly*, 12(4), 4–11.

Glasman N., & Heck R. (1992). The changing leadership role of the principal: implications for principal assessment. *Peabody Journal of Education*, 68(1), 5–24.

Goldstein, H., Huiqi, P., Rath, T., & Hill, N. (2002). *The use of value added information in judging school performance*. London: Institute of Education.

Gottfried, A. E., Fleming, J. S., & Gottfried, A. W. (2001). Continuity of academic intrinsic motivation from childhood through late adolescence: a longitudinal study. *Journal of Educational Psychology*, 93(1), 3–13.

Gottfried, A. E., Marcoulides, G. A., Gottfried, A. W., Oliver, P. H., & Guerin, G. W. (2007). Multivariate latent change modeling of developmental decline in academic intrinsic math motivation and achievement: childhood through adolescence. *International Journal of Behavioral Development*, 31(4), 317–327.

Graham, S., & Golan, S. (1991). Motivational influences on cognition: task involvement, ego involvement, and depth of information processing. *Journal of Educational Psychology*, 83(2), 187–194.

Gray, J., Jesson, D., & Jones, B. (1986). The search for a fairer way of comparing schools' examination results. *Research Papers in Education*, 1(2), 91–122.

Gray, J., Jesson, D., & Sime, N. (1990). Estimating differences in the examination performances of secondary schools in six LEAs: a multi-level approach to school effectiveness. *Oxford Review of Education*, 16(2), 137–158.

Greene, B. A., & Miller, R. B. (1996). Influences on achievement: goals, perceived ability, and cognitive engagement. *Contemporary Educational Psychology*, 21(2), 181–192.

Greene, B. A., Miller, R. B., Crowson, H. M., Duke, B. L., & Akey, K. L. (2004). Predicting high school students' cognitive engagement and achievement: contributions of classroom perceptions and motivation. *Contemporary Educational Psychology*, 29(4), 462–482.

Griffiths, A. J., Lilles, E., Furlong, M. J., & Sidwha, J. (2012). The relations of adolescent student engagement with troubling and high-risk behaviors. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 563–584). New York: Springer.

Grolnick, W. S., Ryan, R. M., & Deci, E. L. (1991). Inner resources for school achievement: motivational mediators of children's perceptions of their parents. *Journal of Educational Psychology*, 83(4), 508–517.

Guskey, T. (2013). Defining student achievement. In J. Hattie, & E. Anderman (Eds.), *International guide to student achievement*. New York: Routledge.

Guthrie, J. T., & Davis, M. H. (2003). Motivating struggling readers in middle school through an engagement model of classroom practice. *Reading and Writing Quarterly*, 19(1), 59-85.

Guthrie, J. T., Wigfield, A., & You, W. (2012). Instructional contexts for engagement and achievement in reading. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 601–634). New York: Springer.

Hallinger, P., Bickman, L., & Davis, K. (1996). School context, principal leadership, and student reading achievement. *The Elementary School Journal*, 96(5), 527–549.

Hallinger, P., & Heck, R. (1996). The principal's role in school effectiveness: an assessment of methodological progress, 1980–1995. In K. Leithwood, & P. Hallinger (Eds.), *International handbook of educational leadership and administration* (pp. 723–784). New York: Kluwer Press.

Hallinger, P., & Heck, R. (1998). Exploring the principal's contribution to school effectiveness: 1980–1995. *School Effectiveness and School Improvement*, 9(2), 157–191.

Hamre, B., & Pianta, R. (2001). Early teacher–child relationships and the trajectory of children's school outcomes through eighth grade. *Child Development*, 72(2), 625–638.

Hanushek, E., & Rivkin, S. G. (2006). Teacher quality. In E. Hanushek, & F. Welch (Eds.), *Handbook of the economics of education* (pp. 1052–1080). Amsterdam: Elsevier.

Hargreaves, A., & Fink, D. (2006). *Sustainable leadership*. San Francisco: Jossey-Bass.

Harter, S. (1996). Teacher and classmate influences on scholastic motivation, self-esteem, and level of voice in adolescents. In J. Juvonen, & K. R. Wentzel (Eds.), *Social motivation: understanding children's school adjustment* (pp. 11–42). New York: Cambridge University Press.

Haskins, R., Walden, T., & Ramey, C. T. (1983). Teacher and student behavior in high- and low-ability groups. *Journal of Educational Psychology*, 75(6), 865–876.

Hattie, J. (2009). *Visible learning: a synthesis of over 800 meta-analyses relating to achievement*. London: Routledge.

Hauser, R. M. (1994). Measuring socioeconomic status in studies of child development. *Child Development*, 65(6), 1541–1545.

Hawkins, J. D., Guo, J., Hill, K. G., Battin-Pearson, S., & Abbott, R. D. (2001). Long-term effects of the Seattle social development intervention on school bonding trajectories. *Applied Developmental Science*, 5(4), 225–236.

Heyneman, S. P., & Loxley, W. A. (1982). Influences on academic achievement across high and low income countries: a re-analysis of IEA data. *Sociology of Education*, 55(1), 13–21.

Hipkins, R. (2012). The engaging nature of teaching for competency development. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 441–456). New York: Springer.

Howse, R. B., Lange, G., Farran, D. C., & Boyles, C. D. (2003). Motivation and self-regulation as predictors of achievement in economically disadvantaged young children. *The Journal of Experimental Education*, 71(2), 151–174.

Hughes, J., & Kwok, O. (2007). Influence of student–teacher and parent–teacher relationships on lower achieving readers' engagement and achievement in the primary grades. *Journal of Educational Psychology*, 99(1), 39–51.

Hughes, J. N., Luo, W., Kwok, O.-M., & Loyd, L. K. (2008). Teacher–student support, effortful engagement, and achievement: a 3-year longitudinal study. *Journal of Educational Psychology*, 100(1), 1–14.

IIPE-UNESCO. (2010). *Estudio de caracterización de las escuelas de tiempo completo (ETC) en México. Encuesta a directores y equipos estatales*. Buenos Aires: IIPE-UNESCO.

INEE. (2012). *Panorama educativo de México: indicadores del sistema educativo nacional*. México: INEE.

INEGI. (2011). *Informativo oportuno, conociéndonos todos*. Mexico: INEGI.

Janosz, M. (2012). A part IV commentary: outcomes of engagement and engagement as an outcome: some consensus, divergences, and unanswered questions. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 695–703). New York: Springer.

Jimerson, S. R., Campos, E., & Greif, J. L. (2003). Toward an understanding of definitions and measures of school engagement and related terms. *California School Psychologist*, 81(1), 7–27.

Johnson, D. W., Johnson, R. T., Buckman, L.A., & Richards, P. S. (1985). The effect of prolonged implementation of cooperative learning on social support within the classroom. *The Journal of Psychology*, 119(5), 405–411.

Kingir, S., Tas, Y., Gok, G., & Vural, S. S. (2013). Relationships among constructivist learning environment perceptions, motivational beliefs, self-regulation and science achievement. *Research in Science Technological Education*, 31(3), 205–226.

Kleine-Kracht, P. A. (1993). The principal in a community of learning. *Journal of School Leadership*, 3(4), 391–399.

Klem, A. M., & Connell, J. P. (2004). Relationships matter: linking teacher support to student engagement and achievement. *Journal of School Health*, 74(7), 262–273.

Kreuter, F., Eckman, S., Maaz, K., & Waterman, R. (2010). Children's reports of parents' education level. Does it matter whom you ask and what you ask about? *Survey Research Methods*, 4(3), 127–138.

Kruger, M., & Scheerens, J. (2012). Conceptual perspectives on school leadership. In J. Scheerens (Ed.), *School leadership effects revisited: review and meta-analysis of empirical studies* (pp. 1–33). New York: Springer.

Kruger, M., Witziers, B., & Sleegers, P. (2007). The impact of school leader variables on school level factors: validation of a causal model. *School Effectiveness and School Improvement*, 18(1), 1–20.

Ladd, G. W., & Dinella, L. M. (2009). Continuity and change in early school engagement: predictive of children's achievement trajectories from first to eighth grade? *Journal of Educational Psychology*, 101(1), 190–206.

Lee, J. S. (2012).The effects of the teacher–student relationship and academic press on student engagement and academic performance. *International Journal of Educational Research*, 53, 330–340.

Lee V. E., & Smith, J. B. (1993). Effects of school restructuring on the achievement and engagement of middle-grade students. *Sociology of Education*, 66(3), 164–187.

Lehr, C. A., Sinclair, M. F., & Christenson, S. L. (2004). Addressing student engagement and truancy prevention during the elementary years: a replication study of the check & connect model. *Journal of Education for Students Placed At Risk*, 9(3), 279–301.

Leithwood K. (1994). Leadership for school restructuring. *Educational Administration Quarterly*, 30(4), 498–518.

Leithwood, K., Day, C., Sammons, P., Harris, A., & Hopkins, D. (2006). *Successful school leadership: what it is and how it influences pupil learning*. London: DfES.

Leithwood, K., & Jantzi, D. (2000). The effects of transformational leadership on organizational conditions and student engagement with school. *Journal of Educational Administration*, 38(2), 112–129.

Leithwood, K., & Levin, B. (2005). *Assessing school leader and leadership programme effects on pupil learning*. London: DfES.

Lepper, M. R., Corpus, J. H., & Iyengar, S. S. (2005). Intrinsic and extrinsic motivational orientations in the classroom: age differences and academic correlates. *Journal of Educational Psychology*, 97(2), 184–196.

Levenstein, R. (2016). *2014 My Voice, My School Survey quality profile, technical report*. Chicago: University of Chicago Consortium on Chicago School Research.

Libbey, H. P. (2004). Measuring student relationships to school: attachment, bonding, connectedness, and engagement. *Journal of School Health*, 74(7), 274–283.

Lindsay, P. (1984). High school size, participation in activities, and young adult social participation: some enduring effects of schooling. *Educational Evaluation and Policy Analysis*, 6(1), 73–83.

Liska, A, E., & Reed, M. D. (1985). Ties to conventional institutions and delinquency: estimating reciprocal effects. *American Sociological Review*, 50(4), 547–560.

Looker E. D. (1989). Accuracy of proxy reports of parental status characteristics. *Sociology of Education*, 62(4), 257–276.

Luckner, A. E., Englund, M. M., Coffey, T., & Nuno, A. A. (2006). Validation of a global measure of school engagement in early and middle adolescence. In M. M. Englund (Chair), *Adolescent engagement in school: issues of definition and measurement*. Symposium conducted at the biennial meeting of the Society for Research on Adolescence, San Francisco, CA.

Ma, X. (2003). Sense of belonging to school: can schools make a difference? *The Journal of Educational Research*, 96(6), 340–349.

Mahatmya, D, L., Lohman, B. J., Matjasko, J. L., & Farb, A. F. (2012). Engagement across developmental periods. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 45–63). New York: Springer.

Marks, H. (2000). Student engagement in instructional activity: patterns in the elementary, middle, and high school years. *American Educational Research Journal*, 37(1), 153–184.

Marks, H., & Printy, S. (2003). Principal leadership and school performance: an integration of transformation and instructional leadership. *Educational Administration Quarterly*, 39(3), 370–397.

Marzano, R. J. (2007). Leadership and school reform factors. In T. Townsend (Ed.), *International handbook of school effectiveness and improvement* (pp. 597–614). New York: Springer.

Mason, W., Hauser, R. M., Kerckhoff, A. C., Poss, S. S., & Manton, K. (1976). Models of response error in student reports of parental socioeconomic characteristics. In W. H. Sewell, R. M. Hauser, & D. L. Featherman (Eds.), *Schooling and achievement in American society* (pp. 443–519). New York: Academic Press.

McCall, M. S., Kingsbury, G. G., & Olson, A. (2004). *Individual growth and school success*. Lake Oswego: Northwest Evaluation Association.

McNeely, C. A., Nonnemaker, J. M., & Blum, R. W. (2002). Promoting student connectedness to school: evidence from the national longitudinal study of adolescent health. *Journal of School Health*, 72(4), 138–146.

Michael, R. T. (2004). Family influences on children's verbal ability. In A. Kalil, & T. DeLeire (Eds.), *Family investments in children: resources and behaviors that promote success* (pp. 48–84). Mahwah: Lawrence Erlbaum Associates.

Midgley, C., & Urdan, T. (1995). Predictors of middle school students' use of self-handicapping strategies. *The Journal of Early Adolescence*, 15(4), 389–411.

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis*. Thousand Oaks: Sage Publications.

Miller, R. B., Greene, B. A., Montalvo, G. P., Ravindran, B., & Nicholls, J. D. (1996). Engagement in academic work: the role of learning goals, future consequences, pleasing others, and perceived ability. *Contemporary Educational Psychology*, 21(4), 388–442.

Minner, D. D., Levy, A. J., & Century, J. (2010). Inquiry based science instruction: what is it and does it matter? Results from a research synthesis, years 1984 to 2002. *Journal of Research in Science Teaching*, 47(4), 474–496.

Muijs, D., & Reynolds, D. (2010). *Effective teaching: evidence and practice*. London: Sage.

Mulford, B., & Silins, H. (2003). Leadership for organisational learning and improved student outcomes. *Cambridge Journal of Education*, 33(2), 175–195.

Newmann, F. M. (1981). Reducing student alienation in high schools: implications of theory. *Harvard Education Review*, 51(4), 546–564.

Newmann, F. M. (1992). *Student engagement and achievement in American secondary schools*. New York: Teachers College Press.

Newmann, F. M., Wehlage, G. G., & Lamborn, S. D. (1992). The significance and sources of student engagement. In F. M. Newmann (Ed.), *Student engagement and achievement in American secondary schools* (pp. 11–30). New York: Teachers College Press.

OECD. (2003). *Student engagement at school: a sense of belonging and participation*. OECD Publishing.

OECD. (2008). *Measuring improvements in learning outcomes: best practices to assess the value-added of schools*. Paris: OECD Publishing.

OECD. (2011). Disciplinary climate during lessons. In *PISA 2009 at a Glance*. Paris: OECD Publishing.

OECD. (2013a). *PISA 2012 results: excellence through equity: giving every student the chance to succeed (volume II)*. PISA, OECD Publishing.

OECD. (2013b). *México nota país, resultados PISA 2012*. PISA, OECD Publishing.

OECD. (2013c). *PISA 2012 results: ready to learn (volume III): students' engagement, drive and self-beliefs*. PISA, OECD Publishing.

OECD. (2013d). *PISA 2012 results: what makes schools successful? Resources, policies and practices (volume IV)*. PISA, OECD Publishing.

OECD. (2015). Mexico country note, results from PISA 2015. PISA, OECD Publishing.

OECD. (2016). *PISA 2015 results: policies and practices for successful schools (volume II)*. PISA, OECD Publishing.

Oreopoulos, P., Page, M. E., & Stevens, A. H. (2003). *Does human capital transfer from parent to child? the intergenerational effects of compulsory schooling* (No.10164). Cambridge: National Bureau of Economic Research.

Osterman, K. F. (2000). Students' need for belonging in the school community. *Review of Educational Research*, 70(3), 323–367.

Parsons, J., McRae, P., & Taylor, L. (2006). *Celebrating school improvement: six lessons from Alberta's AISI projects*. Edmonton: School Improvement Press.

Parsons, J., & Taylor, L. (2011). *Student engagement: what do we know and what should we do?* Edmonton: University of Alberta.

Perry, J. D., Guidubaldi, J., & Kehle, T. J. (1979). Kindergarten competencies as predictors of third-grade classroom behavior and achievement. *Journal of Educational Psychology*, 71(4), 443–450.

Peterson, P. L., Swing, S. R., Braverman, M. T., & Buss, R. (1982). Students' aptitudes and their reports of cognitive processes during direct instruction. *Journal of Educational Psychology*, 74(4), 535–547.

Peterson, P. L., Swing, S. R., Stark, K. D., & Waas, G. A. (1984). Students' cognitions and time on task during mathematics instruction. *American Educational Research Journal*, 21(3), 487–515.

Pintrich, P. R., & De Groot, E. (1990). Motivated and self-regulated learning components of academic performance. *Journal of Educational Psychology*, 82(1), 33–40.

Pintrich, P. R., & Garcia, T. (1991). Student goal orientation and self-regulation in the college. In M. Maehr, & P. R. Pintrich (Eds.), *Advances in motivation and achievement: goals and self-regulatory processes* (pp. 271–402). Greenwich: JAI Press.

Pounder, D. G., Ogawa, R. T., & Adams, E. A. (1995). Leadership as an organization-wide phenomenon: its impact on school performance. *Educational Administration Quarterly*, 31(4), 564–588.

Ray, A. (2006). *School value added measures in England*. London: Department for Education and Skills.

Reeve, J. (2012). A self-determination theory perspective on student engagement. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 149–172). New York: Springer.

Reitzug, U., & Patterson, J. (1998). 'I'm not going to lose you!' Empowerment through caring in an urban principal's practice with pupils. *Urban Education*, 33(2), 150–181.

Reschly, A. L., & Christenson, S. L. (2006). Promoting school completion. In G. Bear, & K. Minke (Eds.), *Children's needs III: understanding and addressing the developmental needs of children* (pp. 103–113). Bethesda: National Association of School Psychologists.

Reschly A. L., & Christenson, S. L. (2012). Jingle, jangle, and conceptual haziness: evolution and future directions in the engagement construct. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 3–19). New York: Springer.

Reynolds, D. (2014). Educational effectiveness research (EER): a state-of-the-art review. *School Effectiveness and School Improvement*, 25(2), 197–230.

Ripski, M. B., & Gregory, A. (2009). Unfair, unsafe, and unwelcome: do high school students' perceptions of unfairness, hostility, and victimization in school predict engagement and achievement? *Journal of School Violence*, 8(4), 355–375.

Rivkin, S., Hanushek E., & Kain, J. (2005). Teachers, schools and academic achievement. *Econometrica*, 73(2), 417–458.

Robson, C. (2011). *Real world research*. Oxford: Wiley-Blackwell.

Roehrig, A. D., Bohn, C. M., Turner, J. E., & Pressley, M. (2008). Mentoring beginning primary teachers for exemplary teaching practices. *Teaching and Teacher Education*, 24(3), 684–702.

Roehrig, A. D., Brinkerhoff, E. H., Rawls, E. S., & Pressley, T. (2013). Motivating classroom practices to support effective literacy instruction. In B. M. Taylor, & N. K. Duke (Eds.), *Handbook of effective literacy instruction: research-based practice K-8*. New York: Guilford Press.

Roehrig, A. D., & Christesen, E. (2010). Development and use of a tool for evaluating teacher effectiveness in grades K-12. In V. J. Shute, & B. J. Becker (Eds.), *Innovative assessment for the 21st century: supporting educational needs* (pp. 207–228). New York: Springer.

Rosenthal, B. S. (1998). Non-school correlates of dropout: an integrative review of the literature. *Children & Youth Services Review*, 20(5), 413–433.

Rowe, K. J., & Rowe, K. S. (1992). The relationship between inattentiveness in the classroom and reading achievement: part A: methodological issues. *Journal of American Academy of Child and Adolescent Psychiatry*, 31(2), 349–356.

Rumberger, R. W. (1987). High school dropouts: a review of issues and evidence. *Review of Educational Research*, 57(2), 101–121.

Rumberger, R. W. (1995). Dropping out of middle school: a multilevel analysis of students and schools. *American Educational Research Journal*, 32(3), 583–625.

Ryan A, M., & Patrick, H. (2001). The classroom social environment and changes in adolescents' motivation and engagement during middle school. *American Educational Research Journal*, 38(2), 437–460.

Sanders, W. L., & Rivers, J. C. (1996). *Cumulative and residual effects of teachers on future students' academic achievement*. Knoxville: University of Tennessee Value-Added Research and Assessment Center.

Santibáñez, L., Martínez, J., Datar, A., McEwan, P., Messan-Setodji, C., & Basurto-Dávila, R. (2006). *Análisis del sistema de evaluación y del impacto del programa de estímulos docentes carrera magisterial en México*. México: RAND Educación.

Saunders, L. (1999). *Value added measurement of school effectiveness: a critical review*. Slough: National Foundation for Educational Research.

Savage, R., Deault, L., & Burgos, G. (2008). *Effective literacy instruction: a Canadian perspective*. Paper presented at the FCRR Research Symposium, Tallahassee, FL.

Schulz, W. (2005). *Measuring the socio-economic background of students and its effect on achievement in PISA 2000 and PISA 2003*. Paper presented at the annual meeting of the American Educational Research Association, San Francisco, CA, April 7–11, 2006.

SEP. (2011). *Programas de estudio 2011, guía para el maestro. Sexto Grado*. México: Secretaria de Educación Púplica.

SEP. (2012). *Sistema educativo de los estados unidos mexicanos, principales cifras del sistema educativo nacional 2011–2012*. México: Secretaria de Educación Púplica.

SEP. (2013). *Sistema educativo de los estados unidos mexicanos, principales cifras del sistema educativo nacional 2012–2013*. México: Secretaria de Educación Púplica.

SEP. (2015). *Sistema educativo de los estados unidos mexicanos, principales cifras del sistema educativo nacional 2014–2015*. México: Secretaria de Educación Púplica.

Sinclair, M. F., Christenson, S. L., Evelo, D., & Hurley, C. (1998). Dropout prevention for high-risk youth with disabilities: efficacy of a sustained school engagement procedure. *Exceptional Children*, 65(1), 7–21.

Sinclair, M. F., Christenson, S. L., Lehr, C. A., & Anderson, A. R. (2003). Facilitating student engagement: lessons learned from check & connect longitudinal studies. *The California School Psychologist*, 8(1), 29–42.

Sinclair, M. F., Christenson, S. L., & Thurlow, M. L. (2005). Promoting school completion of urban secondary youth with emotional or behavioral disabilities. *Exceptional Children*, 71(4), 465–482.

Skinner, E. A. (1996). A guide to constructs of control. *Journal of Personality and Social Psychology*, 71(3), 549–570.

Skinner, E. A., & Belmont, M. J. (1993). Motivation in the classroom: reciprocal effect of teacher behavior and student engagement across the school year. *Journal of Educational Psychology*, 85(4), 571–581.

Skinner, E. A., Furrer, C., Marchand, G., & Kindermann, T. (2008). Engagement and disaffection in the classroom: part of a larger motivational dynamic? *Journal of Educational Psychology*, 100(4), 765–781.

Skinner, E. A., Kindermann, T. A., & Furrer, C. (2009). A motivational perspective on engagement and disaffection: conceptualization and assessment of children's behavioral and emotional participation in academic activities in the classroom. *Educational and Psychological Measurement*, 69(3), 493–525.

Skinner, E., & Pitzer, J. R. (2012). Developmental dynamics of student engagement, coping, and everyday resilience. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 21–44). New York: Springer.

Steinberg, L., Lamborn, S. D., Dornbusch, S. M., & Darling, N. (1992). Impact of parenting practices on adolescent achievement: authoritative parenting, school involvement, and encouragement to succeed. *Child Development*, 63(5), 1266–1281.

Stipek, D. J. (2002). Good instruction is motivating. In A. Wigfield, & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 309–332). San Diego: Academic Press.

Taylor, L., & Parsons, J. (2011). Improving student engagement. *Current Issues in Education*, 14(1), 1–33.

Teodorovic, J. (2011). Classroom and school factors related to student achievement: what works for students? *School Effectiveness and School Improvement*, 22(2), 215–236.

Tobias, S. (1982). When do instructional methods make a difference? *Educational Researcher*, 11(4), 4–9.

Turner, J. C., Meyer, D. K., Cox, K. E., Logan, C., DiCintio, M., & Thomas, C. T. (1998). Creating contexts for involvement in mathematics. *Journal of Educational Psychology*, 90(4), 730–745.

UNESCO. (2014). *EFA Global monitoring report 2013/4. Teaching and learning: achieving quality for all*. Paris: UNESCO.

Vegas, E., & Petrow, J. (2007). *Raising student learning in Latin America: the challenge for the 21st century*. Washington: The World Bank.

Velez, E., Schiefelbein, E., & Valenzuela, J. (1993). *Factors affecting achievement in primary education*. Washington: The World Bank.

Vieluf, S., Kaplan, D., Klieme E., Bayer, S. (2012). *Teaching practices and pedagogical innovation: evidence from TALIS*. OECD Publishing.

Voelkl, K. E. (1995). School warmth, student participation, and achievement. *The Journal of Experimental Education*, 63(2), 127–138.

Voelkl, K. E. (1997). Identification with school. *American Journal of Education*, 105(3), 294–318.

Voelkl, K. E. (2012). School identification. In S. L. Christenson, A. L. Reschly, & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 193–218). New York: Springer.

Waters, T., Marzano, R. J., & McNulty, B. (2003). *Balanced leadership: what 30 years of research tells us about the effect of leadership on pupil achievement*. Denver: Mid-continent Research for Education and Learning (McREL).

Wehlage, G. G., & Rutter, R. A. (1986). Dropping out: how much do schools contribute to the problem? In G. Natriello (Ed.), *School dropouts: patterns and policies* (pp. 70–88). New York: Teachers College Press.

Wehlage, G. G., Rutter, R.A., Smith, G. A., Lesko, N., & Fernandez, R. R. (1989). *Reducing the risk: schools as communities of support*. Philadelphia: Falmer Press.

Weiner, B. (2005). Motivation from an attributional perspective and the social psychology of perceived competence. In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of competence and motivation* (pp. 73–84). New York: Guilford.

Weinstein, C., & Mayer, R. (1986). The teaching of learning strategies. In M. C. Wittrock (Ed.), *Handbook of research on teaching and learning* (pp. 315–327). New York: Macmillan.

Weiss, C. C., & García, E. (2015). Student engagement and academic performance in Mexico: evidence and puzzles from PISA. *Comparative Education Review*, 59(2), 305–331.

Wentzel, K. R. (1997). Student motivation in middle school: the role of perceived pedagogical caring. *Journal of Educational Psychology*, 89(3), 411–419.

Wentzel, K. R. (1998). Social relationships and motivation in middle school: the role of parents, teachers, and peers. *Journal of Educational Psychology*, 90(2), 202–209.

Wigfield, A., & Eccles, J. S. (2002). The development of competence beliefs and values from childhood through adolescence. In A. Wigfield, & J. S. Eccles (Eds.), *Development of achievement motivation* (pp. 92–120). San Diego: Academic Press.

Wigfield, A., Eccles, J. S., Scheifele, U., Roeser, R., & Davis-Kean, P. (2006). Development of achievement motivation. In Damon W. (Series Ed.), Eisenberg N. (Vol. Ed.), *Handbook of child psychology: vol. 3, social, emotional, and personality development* (pp. 933–1002). New York: John Wiley.

Wigfield, A., Guthrie, J. T., Perencevich, K. C., Taboada, A., Klauda, S. L., McRae, A., & Barbosa, P. (2008). Role of reading engagement in mediating effects of reading comprehension instruction on reading outcomes. *Psychology in the Schools*, 45(5), 432–445.

Willms, J. D., Friesen, S., & Milton, P. (2009). *What did you do in school today? Transforming classrooms through social, academic and intellectual engagement*. Toronto: Canadian Education Association.

Winne, P. H., & Marx, R. W. (1977). Reconceptualizing research on teaching. *Journal of Educational Psychology*, 69(6), 668–678.

Wolters, C. A., & Pintrich, P. R. (1998). Contextual differences in student motivation and self-regulated learning in mathematics, English, and social studies classrooms. *Instructional Science*, 26(1), 27–47.

Yin, R. (2009). *Case study research: design and methods* (4th ed.). Thousand Oaks: Sage Publications.

Zimmerman, B. J. (1990). Self-regulated learning and academic achievement: an overview. *Educational Psychologist*, 25(1), 3–17.

APPENDICES

Appendix 1 – Scores in ENLACE

The National Evaluation of Academic Achievement in Schools (ENLACE) was administered by the SEP from 2006 to 2013. The test was applied annually, census-style, to students from basic to upper secondary level. The evaluation measured the extent of knowledge and skills in Language, Mathematics and a third subject that alternated every year.

What is the range of the scale used in ENLACE?

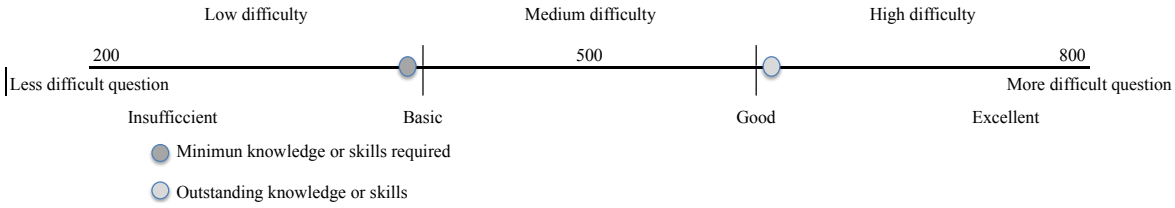
Scores in ENLACE are reported on a scale from 200 to 800. However, a subscale is also used to assign students to different levels of achievement, making it possible to compare results across years. In the subscale (which is based on Item Response Theory) students' scores do not depend only on the number of correct responses, but also on the questions that the students answered correctly (i.e. more or less difficult questions). By using this scale, it is possible to determine the achievement level of a student and compare his/her results to the results of other students in the country.

How is the test scored?

Scores are calculated in two different phases. During the first phase, the facility and discrimination index of the questions is analysed. During the second phase, the instrument is calibrated and students' responses are graded according to Item Response Theory, which considers three different factors: discrimination, difficulty and guessing. Once the scores have been established, this value is transformed to a standardized form, with mean 500 and standard deviation of 100, using the following function:

$$\text{Score} = 100 + \frac{(\text{x} - \text{a})}{\text{b}} + 500$$

where, *x* is the student measure, *a* is the reference measure, and *b* is the reference measure minus the standard deviation.



How are the levels of difficulty and achievement determined?

In order to determine the achievement levels, the questions are first distributed on a scale and ordered from the easiest to the hardest. Then, a first breakpoint is established. This breakpoint starts in the easiest question and ends in the question that if answered correctly implies the minimum understanding required in that construct. Next, a second breakpoint is determined. It starts in the most difficult question and ends in the question that if answered correctly implies having knowledge or skills that are classified as outstanding. Once these breakpoints have been determined, three levels of difficulty are established. Then, the midpoint of each of these three levels is established, which allows having four levels of achievement (i.e. insufficient, basic, good and excellent). The following scheme represents the procedure:

Students in the insufficient level answer to less than 50 per cent of the questions in the low difficulty range, and students in the excellent level answer to at least 50 per cent of the questions of high difficulty. The breakpoints for the levels of achievement are defined independently for each subject and grade. The scales for the years 2013, 2012 and 2011 for every subject in 6th and 3rd grades are shown below:

			Achievement Level					
			Insufficient	Basic		Good		Excelente
Year	Grade	Subject	Less than or equal to	Greater than	Less than or equal to	Greater than	Less than or equal to	Greater than
2013	6rd grade	Spanish	413.843242	413.843242	581.624259	581.624259	714.008194	714.008194
		Mathematics	412.609821	412.609821	608.127787	608.127787	735.704144	735.704144
	3th grade	Spanish	416.427038	416.427038	560.301233	560.301233	691.593427	691.593427
		Mathematics	419.633171	419.633171	565.623440	565.623440	674.076003	674.076003
2012	6th grade	Spanish	413.843242	413.843242	581.624259	581.624259	714.008194	714.008194
		Mathematics	412.609821	412.609821	608.127787	608.127787	735.704144	735.704144
	3rd grade	Spanish	416.427038	416.427038	560.301233	560.301233	691.593427	691.593427
		Mathematics	419.633171	419.633171	565.623440	565.623440	674.076003	674.076003
2011	6th grade	Spanish	416.427038	416.427038	560.301233	560.301233	691.593427	691.593427
		Mathematics	419.633171	419.633171	565.623440	565.623440	674.076003	674.076003
	3rd grade	Spanish	413.843242	413.843242	581.624259	581.624259	714.008194	714.008194
		Mathematics	412.609821	412.609821	608.127787	608.127787	735.704144	735.704144

Are the results comparable?

The results from the test are comparable at the horizontal level but not at the vertical level. This means that it is correct to make comparisons through the years in the same grade levels and the same subject (e.g. compare 6th grade results from 2011 in Mathematics and 6th grade results from 2012 in Mathematics), but it is incorrect to make comparisons through the years in different grade levels (e.g. it is not possible to compare 6th grade results from 2011 in Mathematics and 3rd grade results from 2012 in the same subject).

Horizontal comparison

In order to make the results comparable across years (in the same grade level) ENLACE selects a sample of students who answer a general test and a pre-test. The objective of conducting a pre-test is piloting questions that will be included the next year in the general test and ensure that the scale of the questions in the pre-test is in the same metric as the questions in the general test. The pre-test is not applied to a nationally representative sample, but instead to a sample of 5,000 students for every subject and grade level. The schools participating in the pre-test should serve a large number of students and are randomly selected. Once the pre-test has been applied, a psychometric analysis of the items is conducted using the parameters of the Classical Test Theory, which includes a difficulty and a discrimination index.

The calibration process was conducted as follows. In the year 2006 students in 3rd grade took the general test A and the pre-test B. The following year (2007), the items in the pre-test became part of the general test B. The items in the general test B were calibrated in the same scale as the items in the general test A. Starting in the second year (2007) the students were graded using the parameters of the questions that were obtained the year before (2006). This method ensures that the scores for each grade and subject are in the same scale as the corresponding scores in the base year (2006).

Is the test stable?

In order to ensure the comparability between the pre-test and the general test, a correlation between the parameter measuring the difficulty level of every item from the general test, and the corresponding parameter of items from the pre-test is conducted. The correlation between the variables should be positive and strong for the test to be considered stable.

The correlations for all items in the test for the year 2013 were never below 0.993. In addition to this procedure, the means and standard deviations of the two variables are also compared. The matching process is highly reliable with no deviation from the original scale, which ensures comparability of results for each grade and subject across years.

Appendix 2 – Education System in Mexico

National context

Mexico is a democratic federal republic constituted by 31 states (federal entities) and a Federal District. According to the most recent population census conducted in 2010, Mexico has 112 million inhabitants, making it the eleventh most populous country in the world. According to the National Institute of Statistics and Geography (INEGI), about 78 per cent of Mexico's population lives in urban areas characterized by high concentrations of population. According to the Institute, eight out of ten people in the country live in urban areas and 13 per cent of the population lives in towns of more than 1 million inhabitants. However, the country also faces a large dispersion, with 10.6 million people living in 173,000 towns of less than 500 inhabitants (INEGI, 2011).

Provision of education services

Until the year 1992, primary schools, lower secondary schools and institutions for teacher education (*Escuelas Normales*) were managed by the federal government through the SEP. In the year 1992 a National Agreement for the Modernization of Basic Education was signed between the federal government, the local governments (states) and the National Union of Education Workers (SNTE). This agreement led to the modification of the Federal Law of Education and the National Constitution, and transferred the control of school management from the SEP to the states.

Following this agreement and accordingly to the General Law of Education, local governments (states) are responsible for the provision of education services for students attending basic and special education. In addition, states are responsible for the provision of education services at the Escuelas Normales, and for the in-service teacher training. Only in the Federal District, the education services are provided directly by the SEP. Private schools, as well as autonomous institutions, also provide educational services. Both public and private providers are obligated to teach the curriculum established by the SEP (SEP, 2012).

The General Law of Education also established that the SEP remained the normative authority of the education system. Consequently, the SEP is responsible for designing the national policy on education and establishing the federal funding. The SEP also develops

the national curriculum, defines the school calendar, and designs the textbooks to be used in public schools. Moreover, the SEP is in charge of planning and executing the national assessments, and promoting the dialogue with the SNTE.

Main features of the education system

The school system in Mexico is organized in two levels. The first level is basic education, which starts at age 3 and ends at age 14. The first stage in basic education is pre-primary education from age 3 to 5; the second stage is primary education from age 6 to 11; and the third stage is lower secondary from 7th to 9th grade and for children between 12 and 15 years old.

The second level is upper secondary. This level can be completed by attending general programmes (preparatory) or technical–professional programmes, and is intended to provide services to students who are between 15 and 17 years old. Both programmes are completed in three years (although some institutions offer programmes to be completed in two to five years), and are a pre-requisite to enter higher education. School attendance in Mexico is compulsory starting in pre-primary school and until upper secondary (12th grade). In primary education, students are exposed to a generalist teacher who teaches them all the subjects. Starting in lower secondary, students have one teacher per subject. The following table summarizes the grade levels in the Mexican education system:

	Basic education												Upper-secondary education		
	Preschool			Primary education						Lower secondary education			Preparatory or technical–professional education		
Grade				1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th
Age	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17

Data from SEP, 2013.

During the academic year 2015–2016, the Mexican school system served 36 million students. School services provided by the central and the local government together accounted for 86.6 per cent of the total enrolment, while private schools provided 13.4 per cent of the education services. From the total of students, 71 per cent were enrolled

in basic education, 13.7 per cent in upper secondary, 10 per cent in higher education, and 5.1 per cent in special programmes for workers (SEP, 2015).

During the academic year 2015–2016, public schools served 25.8 million students in basic education. From those students, 4.8 million were enrolled in pre-primary education, 14.2 million in primary education, and 6.8 million in lower secondary education. Public schools also served 4.9 million students attending upper secondary, and 3.6 million students in higher education (SEP, 2015).

Basic education is provided in three different modalities depending on the type of school students attend (i.e. general, indigenous or communitarian). General schools typically serve students in both urban and rural areas, and enroll the majority of students at the pre-primary and primary level. Schools serving indigenous populations are located in indigenous communities and depend on the General Direction of Indigenous Education of the SEP. Instruction in these schools is provided by teachers and bilingual promoters, in the native language of the community and Spanish. In addition, indigenous culture plays a crucial role in the daily activities of these schools.

Communitarian schools are managed by the National Council for Educational Promotion (CONAFE), and provide services to students living in small rural communities (less than 100 inhabitants), and in highly deprived urban areas. Indigenous and communitarian courses supply the needs of students who are part of migrant groups, live in remote locations or have specific cultural needs. According to estimations from the National Institute for Educational Assessment and Evaluation (INEE), in the year 2012 at least 75 per cent of the communitarian courses and 50 per cent of schools serving the indigenous population were located in rural areas (INEE, 2012).

Education services for students attending lower secondary are provided in five modalities. General schools serve approximately 50 per cent of the students enrolled in this education level and provide services to students between 12 and 14 years old in urban and rural areas. Technical schools offer, in addition to general education, the possibility to undertake technical courses such as accounting, electronics and industrial design, among others. These schools prepare students to enter upper secondary or to enter the labour market. Technical schools provide services to 28 per cent of all students enrolled in lower secondary.

Telesecundaria schools (a televised modality) enroll 20 per cent of the students in lower secondary, and were designed to improve access to education in rural and hardly accessible areas. Instruction in this modality is provided in a school setting using television broadcast and printed and digital materials. In this modality teachers are considered facilitators and schools usually have one teacher for all grade levels. Courses for workers enroll 0.5 per cent of all students in lower secondary. These courses target workers who are 15+ years old and who only finished primary education. Schools in this modality follow the curriculum of general schools. Finally, 0.4 per cent of the students in lower secondary attend CONAFE community courses.

As mentioned above, there are two types of upper secondary programmes in Mexico: general programmes (preparatory) and technical–professional programmes. General programmes are currently provided in four modalities: general, televised (telebachillerato), technical, and Colegio de Bachilleres. In the first two modalities, instruction is provided on general subjects, while the last two modalities are more vocational in nature.

Technical–professional programmes range in length from two to four years, and are offered mainly by the National Technical Professional School CONALEP, the largest technical education system in the country. Other providers include the Centers of Technological Studies (CETs), and the State Centers for Scientific and Technological Studies (CECyTE), which are managed by local governments. Students in these programmes receive instruction on general subjects but spend most of their time working on vocational subjects and practical training. According to the SEP, in the school year 2015–2016, 62.1 per cent of students in upper secondary attended general programmes, and 37.9 per cent attended technical–professional programmes (SEP, 2015).

Furthermore, there are also non-school modalities and mixed modes of enrolment, which provide open or distance learning. These modalities include initial education (which is mandatory), education for adults who did not complete basic education, special education (for students with disabilities and gifted) and training for workers.

National standardized test

The Education Quality and Achievement Test (EXCALE) is administered by the INEE and is applied to a representative sample of students in public and private schools across

the country. The test is administered every year in one out of four grades. In preschool, the test evaluates Language and Communication, and Mathematical Thinking. In primary and secondary school, the test evaluates Language (Spanish), Mathematics, Social Studies and Natural Sciences. In addition to the national tests, Mexico also participates in the Teaching and Learning International Survey (TALIS), in the Third Regional Comparative and Explanatory Study (TERCE), and in the Programme for International Student Assessment (PISA).

ENLACE is a census-based standardized assessment that measures students' results at the primary and secondary level. The test was designed and applied annually by the SEP from 2006 to 2013. During the year 2014 the INEE designed a new set of assessments, which started to be applied in the year 2015. At the primary level, ENLACE tested students attending public, private, indigenous and community schools in, 3rd, 4th, 5th and 6th grades. The test was administered at the end of the school year and was mandatory for all students at primary level. The test measured the skills of students in Mathematics and Language (Spanish) and in a third area that alternated each year (i.e. Civics and Ethics, Science, Geography and History). ENLACE also administers additional questionnaires to principals, teachers, students and parents to collect data on socioeconomic background, among others.

It is important to point out that there were concerns regarding the reliability of the results from ENLACE as the scores were used to determine monetary incentives for teachers in primary education. Specifically, the test results accounted for 50 per cent of the teachers' evaluation (Carrera Magistral), and the results from this evaluation were used to reward teachers with salary bonuses that could range from 20 to 200 per cent of the teachers' starting salary (Santibañez et al., 2006). As a consequence of linking the results from ENLACE to the salary bonuses of the teachers, the SEP became suspicious of the results especially for the year 2013 (when the rewards became effective), as some states that historically had low scores performed among the best in the country.

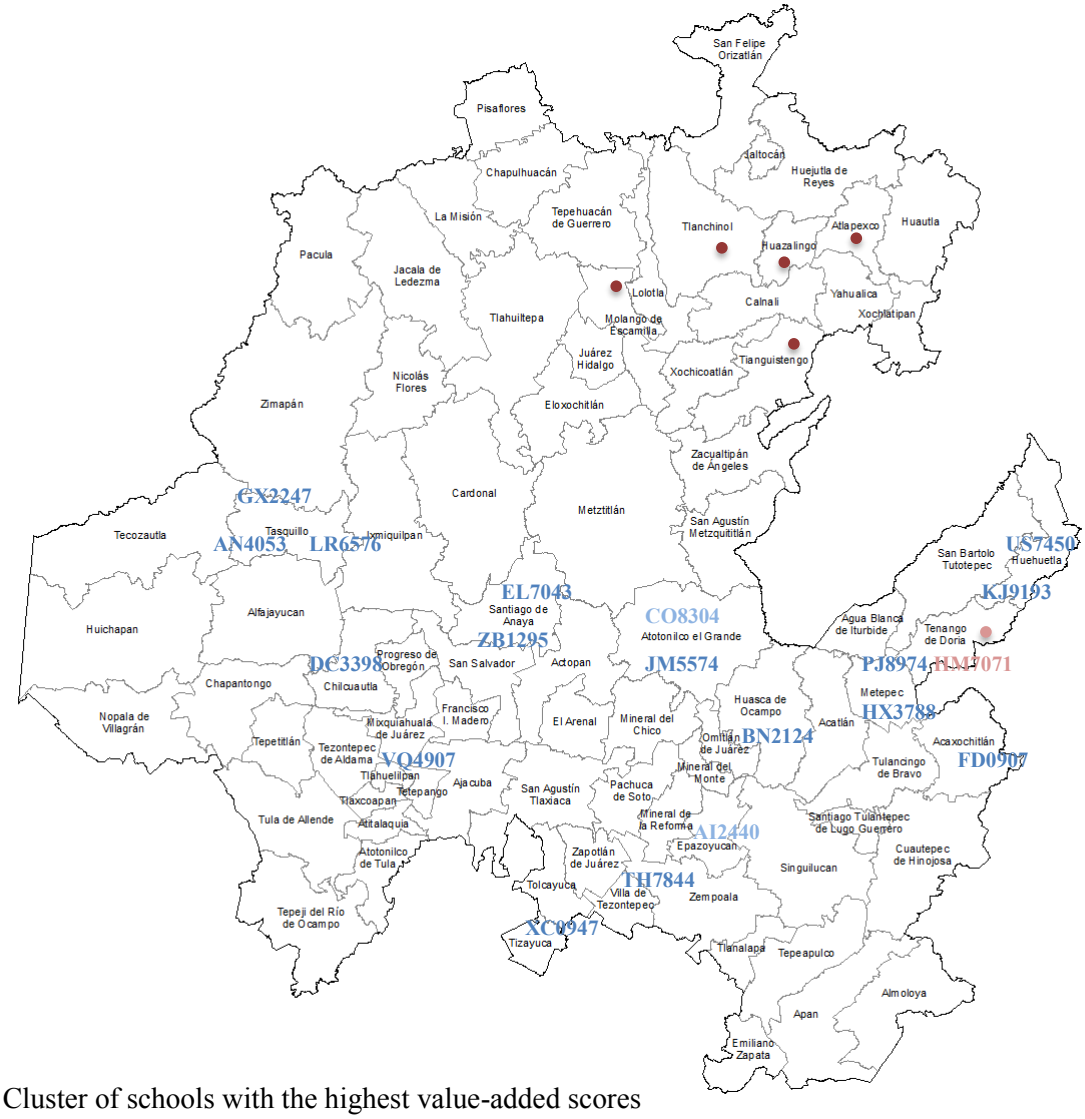
National regulation

The Mexican government has introduced major reforms and policies in the education sector in the last years. In the year 2009, the government introduced a Comprehensive Reform of Basic Education, aimed to increase education coverage in upper secondary and

tertiary education; to provide more autonomy to schools, to establish the full-time programme; to create a teacher professional service; and to promote transparency and the consolidation of an evaluation authority.

Following these efforts, in 2013, the government launched a structural education reform, aimed at improving teaching, school policy and assessment. The reform resulted in a new professional teaching service law aimed to clarify selection, recruitment, training, promotion and evaluation for teachers, school leaders and supervisors. In addition, the reform granted autonomy to the INEE, which co-ordinates the National System for Educational Evaluation. In this new role, the INEE provides the framework for evaluating the quality of the educational system in preschool, primary, lower and upper secondary school. This includes the assessment of pupils, teacher and principals.

Appendix 3 – Location of the Schools in the State (Hidalgo)



- Cluster of schools with the highest value-added scores
- School where the field test for the survey was conducted
- Schools where the research was conducted
- Schools where the case studies were conducted

Appendix 4 – Summary of the Full-time Programme

The full-time school programme in Mexico (*Programa Escuelas de Tiempo Completo*, PETC) began in the school year 2007–2008, with the aim of improving the learning opportunities of students in basic education by increasing the school day from four and a half to eight hours. During the extended schedule, the schools are encouraged to work in six work lines using pedagogical activities that enrich and strengthen students' knowledge, abilities, values and attitudes (IIPE-UNESCO, 2010). These work lines include: i) fostering learning of curricula contents, ii) didactic use of information and communication technologies, iii) learning of additional languages, iv) art and culture, v) healthy life, and vi) recreation and physical development (Cabrera-Hernandez, 2015).

The programme also grants a fixed stipend for the expenses related to the operation of the programme and a varying fund, which depends on the number of students and teachers in the school. The funding is provided yearly and must be used in training and monetary aids for principals, teachers, and support staff members; meal services; didactic materials and computers for education purposes; conditioning and equipping of school spaces (e.g. reconditioning of laboratories, roofed patios, kitchens, dining halls and toilets); the strengthening of the State's Office for the Full-time Schools Programme; and on the programme's monitoring.

In order to be eligible to participate in the programme, schools should meet at least one of the following criteria: i) provide primary education services under the television-assisted modality (Telesecundaria), ii) have low levels of educational achievement and high dropout rates, iii) serve vulnerable and at-risk population, and iv) provide services in localities where the National Delinquency Prevention Program and the National Crusade Against Hunger operate. In addition, the school should be working only in one shift, in either the morning or afternoon, the school should have a technical board, and the community should be opened to participate in the activities of the programme. Once the federal government has considered these requirements, it identifies potential eligible schools and suggests them to the local government. However, the final decision to participate is taken by the school.

Appendix 5 – Student Survey

2015 Student Survey – State of Hidalgo

Name:
Name of the school:
Grade:

I want to know what you think!

Your answers are confidential. No one will be told what you answered. Your answers will be combined with those of other students in your school and across the state to describe what students think, do, and experience. This will allow me to understand how to help students succeed in school.

This survey is voluntary. You do NOT have to answer any question that you do not wish to answer, but I hope you will answer as many questions as you can.

Mark your answer with an X in front of each statement

1) **How much do you agree with the following statements about students in your school? Most students in my school: (EE)***

	Strongly disagree	Disagree	Agree	Strongly agree
01 Like to put others down				
02 Help each other learn				
03 Don't get along together very well				
04 Treat each other with respect				

*The notations in parenthesis at the end of each question are not part of the survey administered to students. Instead, they provide information to the reader about the type of engagement measured in every question (i.e. EE = emotional engagement; BE = behavioural engagement; CE = cognitive engagement) or the type of teacher practice (e.g. TP-Trust).

2) How much do you agree with the following statements about your school: (EE)

	Strongly disagree	Disagree	Agree	Strongly agree
01 I feel like a real part of my school				
02 People here notice when I'm good at something				
03 Other students in my school take my opinions seriously				
04 People at this school are friendly to me				
05 I'm included in lots of activities at school				

3) How much do you agree with the following: (BE)

	Strongly disagree	Disagree	Agree	Strongly agree
01 I always study for tests				
02 I set aside time to do my homework and study				
03 I try to do well on my schoolwork even when it isn't interesting to me				
04 If I need to study, I don't go out with my friends				

4) **To what extent do the following describe you: (BE)**

	Not like me at all	Not much like me	Somewhat like me	Mostly like me	Very much like me
01 I finish whatever I begin					
02 I am a hard worker					
03 I continue steadily toward my goals					
04 I don't give up easily					

5) How much do you agree with the following: (TP-Trust)

	Strongly disagree	Disagree	Agree	Strongly agree
01 When my teacher tells me not to do something, I know he/she has a good reason				
02 I feel safe and comfortable with my teacher at this school				
03 My teacher always keeps her promises				
04 My teacher will always listen to students' ideas				
05 My teacher treats me with respect				

6) How often do your parents do the following: (Parents)

	Never	Some of the time	Most of the time	All the time
01 Encourage you to work hard at school				
02 Are supportive of the things you like to do outside of school				
03 Listen to you when you need to talk				
04 Show they are proud of you				
05 Take time to help you make decisions				

7) How much do you agree with the following statements about your teacher in your Mathematics class: My teacher: (TP-Rigor)

	Strongly disagree	Disagree	Agree	Strongly agree
01 Often connects what I am learning to life outside of the classroom				
02 Encourages students to share their ideas about things we are studying in class				
03 Often requires me to explain my answers				
04 Encourages us to consider different solutions or points of view				
05 Doesn't let students give up when the work gets hard				

8) How much do you agree with the following statements about your Mathematics class: (TP-Academic Press)

	Strongly disagree	Disagree	Agree	Strongly agree
01 This class really makes me think				
02 I'm really learning a lot in this class				

9) In my Mathematics class, my teacher: (TP-Academic Press)

	Strongly disagree	Disagree	Agree	Strongly agree
01 Expects everyone to work hard				
02 Expects me to do my best all the time				
03 Wants us to become better thinkers, not just memorize things				

10) In your Mathematics class, how often: (TP-Academic Press)

	Never	Some of the time	Most of the time	All the time
01 Are you challenged?				
02 Do you have to work hard to do well?				

11) How much do you agree with the following statements about your Mathematics class: (TP-Clarity)

	Strongly disagree	Disagree	Agree	Strongly agree
01 I learn a lot from feedback on my work				
02 It's clear to me what I need to do to get a good grade				
03 The work we do in class is good preparation for the test				
04 The homework assignments help me to learn the course material				
05 I know what my teacher wants me to learn in this class				

12) How much do you agree with the following statements about your Mathematics class: (BE)

	Strongly disagree	Disagree	Agree	Strongly agree
01 I usually look forward to this class				
02 I work hard to do my best in this class				
03 Sometimes I get so interested in my work I don't want to stop				
04 The topics we are studying are interesting and challenging				

13) How much do you agree with the following statements about your Mathematics class: The teacher for this class: (TP-Academic Personalism)

	Strongly disagree	Disagree	Agree	Strongly agree
01 Helps me catch up if I am behind				
02 Is willing to give extra help on schoolwork if I need it				
03 Notices if I have trouble learning something				
04 Gives me specific suggestions about how I can improve my work in this class				
05 Explains things in a different way if I don't understand something in class				

14) How much do you agree with the following statements about your Mathematics class: (TP-Discipline)

	Strongly disagree	Disagree	Agree	Strongly agree
01 I get distracted from my work by other students acting out in this class				
02 This class is out of control				
03 My classmates do not behave the way my teacher wants them to				

15) In your Mathematics class, how often do you: (BE)

	Never	Once in a while	Usually	Always
01 Come to class prepared to participate				
02 Come to class with all of your materials				
03 Pay attention in class				
04 Follow instructions well				

The next section of this survey will ask about <u>strategies</u> you use to study for your Mathematics class. By *strategies*, I mean ways that you study, such as making outlines, writing notes, practising problems, and so on.

16) How much do the following statements describe you in your Mathematics class? (CE-learning strategies)

	Not at all	A little	Somewhat	A lot
01 When I take a test, I realize I have studied the wrong material				
02 I have trouble figuring out how to learn the material for a test				
03 I have trouble understanding exactly what a test question is asking				

17) How much do the following statements describe you in your Mathematics class? (CE-learning strategies)

	Not at all	A little	Somewhat	A lot
01 When I get a new assignment, I think about what it is asking me to do before I start				
02 The type of assignment helps me decide how to study				
03 I have good ways to study for this class				

These questions ask about ways that you <u>organize</u> your own work.

18) In your Mathematics class, how much do the following statements describe you? (CE-learning strategies)

	Not at all	A little	Somewhat	A lot
01 I keep track of my assignments so I know when to turn them in				
02 I manage my time well enough to get all my work done				
03 I set goals for my performance in this class				
04 I have a system for organizing my schoolwork				

19) How much do the following statements describe you in your Mathematics class? (CE)

	Not at all	A little	Somewhat	A lot
01 When I do my schoolwork, I stop to check whether I understand what I'm doing				
02 I put what I am studying into my own words to help me understand it				
03 I review my notes carefully to make sure that I understand them				
04 I quiz myself on the material to prepare for a test				
05 When I finish an assignment, I check my work before I turn it in				

20) How true are the following statements in your Mathematics class? (CE-mindset effort growth with ability)

	Not at all true	A little true	Mostly true	Completely true
01 For me, getting good grades is a matter of luck				
02 I won't do well in this class if my teacher doesn't like me				
03 It's not my fault if I get bad grades				
04 If I don't do well on my schoolwork, it's because the work is too hard				

21) How much do the following statements describe you in your Mathematics class? (CE-perseverance)

	Not at all true	A little true	Mostly true	Completely true
01 I can learn the material in this class, even if the work is hard				
02 I can master the skills taught in this class				
03 I know I can do well on a test, even when it's hard				
04 I am very good at this subject				

22) Think about what you learn in your Mathematics class. How often do you: (CE-mindset hold value)

	Never	Once in a while	Usually	Always
01 Use what you learn in this class in other classes?				
02 Use things you learned in class outside of school?				
03 See connections between what you learn in class and the real world?				

23) How valuable are the skills you've learned in your Mathematics class? (Choose only one answer) (CE mindset hold value)

01 Not valuable at all ☐
02 A little valuable ☐
03 Somewhat valuable ☐
04 Extremely valuable ☐

24) How true are the following statements about your Mathematics class: (CE-mindset hold value)

	Not at all true	A little true	Mostly true	Completely true
01 This class is getting me ready for high school				
02 This class teaches me valuable skills				
03 Working hard in this class matters for doing well in high school				
04 What we learn in this class is necessary for success in the future				

25) How many of the students in your class: (BE)

	None	A few	About half	Most	None
01 Feel it is important to come to school every day					
02 Feel it is important to pay attention in class					
03 Think doing homework is important					
04 Try hard to get good grades					

You're finished! Thank you for your help!

Appendix 6 – Timetable Fieldwork 2015

January

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

February

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

March

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

April

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

May

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

Survey field test

- Administration of the survey in one school*
- Analysis of data from surveys and selection of schools for interviews
- Preparation of interviews and expert review
- Interview pilot
- Interview with head teacher, school AI2440
- Interview with teacher, school AI2440
- Interview with students, school AI2440
- Interview with teacher and students, school CO8304
- Interview with head teacher school, CO8304

*On 16, 26 and 29 April, and 5 and 6 February, the survey was administered in two schools. On 11 February, the survey was administered in three schools.

Appendix 7 – Logistic Protocol for Interviews with Teachers, Head Teachers and Students

Before visiting the school

- ✓ Memorize the questions
- ✓ Memorize the name of students availing of the photos taken during the first school visit
- ✓ Get fully acquainted with the questioning route (identify critical questions)
- ✓ Make arrangements to arrive to school in advance

Logistics before the start of the interview

- ✓ Watch for factors that could interfere with the group session (e.g. background noise, opened windows, closed curtains)
- ✓ Create a friendly, confortable and warm environment
- ✓ Make the seating arrangements. Participants should be seated in a circle, preferably around a table, facing each other, and should be equally spaced around the table
- ✓ Make a sketch of the seating arrangements
- ✓ Observe the students before the start

Introduction to students (Provide consistent background info to participants about the purpose of the study)

Good morning, I thank you all for leaving your class and coming to join me. As you all know, I am performing research on schools in the state of Hidalgo and this school is one of them. Do you remember the survey I conducted a few weeks ago? Well in that meeting you told me that you were engaged in school, and today I want to conduct a group interview in order to understand this engagement a little bit better.

In the interview, I will ask a question and you will take time to think about it and then you can start sharing your answers. It is okay if in addition to your reply you want to discuss your classmates' answers. Please speak one at a time.

There are no correct or incorrect answers, I just want you to tell me your honest opinion on some topics.

Student rules

- ✓ If you need to go to the toilet please do it now. I would rather that you do not go during the interview
- ✓ This session lasts 45 minutes
- ✓ The interview will be recorded in order not to miss any important details of what you will tell me (there was previous consensus with the principal about recording the interviews)
- ✓ When reporting your comments I won't mention your names. Responses will remain confidential. Do you all understand the meaning of 'confidential'?
- ✓ We will have three sessions. This is the first one
- ✓ I have placed cards with your names in front of your desks

Introduction to teacher/head teacher

Good morning, thank you for taking the time to do these interviews. As you know, I am here because of the results children got in the survey where they reported to be engaged in school. What I want to do in this series of interviews is to investigate the teaching practices that may be leading children to be engaged in school. We will discuss your experiences. I am interested in your classroom practices and in other factors that may also be contributing to the children's engagement.

Teacher/head teacher rules

- ✓ The interview will be recorded in order not to miss any of your comments (there was previous consensus with the teacher and the principal about recording the interviews)

- ✓ I assure you confidentiality in the answers
- ✓ I am equally interested in positive comments as in negative ones, as they can also come in handy
- ✓ We will have (as agreed) four sessions, this one included
- ✓ Each session takes two hours
- ✓ The questionnaire has 46 open-ended questions; it is estimated they can be fully answered in eight hours

During the interview

- ✓ Turn on the recorder and say the date, name of school, locality, number of session, group number (in the case of interviews with students), and number of participants following the sketch of the seating arrangement
- ✓ Monitor the time
- ✓ Check if the recorder is working
- ✓ **Don't talk, hold back your personal opinions, suspend personal views and seek the perception of the group participants**
- ✓ **Avoid head nodding**
- ✓ **Avoid short verbal responses like excellent, correct, that is good, okay**
- ✓ Focus completely on the group conversation
- ✓ Keep eye contact with really shy students; quickly move on the next question if anyone digresses a lot or expands too much on the response
- ✓ Take notes
    - o Identify key ideas
    - o Identify future questions that you have not included in the questionnaire

- Take comprehensive notes (key points, notable quotes, silence, body language)
- Consider the energy level or enthusiasm of respondents (you cannot see this in the recording)
- Note the degree of spontaneity and extent of participant involvement
- Place your opinions in parenthesis
- Look for evidence that repeats in several participants

When asking the questions

- ✓ Ask the first questions fast
- ✓ Ask just one question at a time, avoid double questions
- ✓ Do not use technical terms
- ✓ Do not read the questions, always keep contact with the students
- ✓ Do not move quickly to the next question, instead count five seconds, waiting for more information
- ✓ Ask uncued questions first and cue questions second (if you provide examples at the beginning this can restrict the thinking of the participants)
- ✓ If students can provide a clear answer you can now provide cues:

  Follow up questions: why is that?, why did he do that?, how did you feel?, would you explain further?, would you give me an example of what you mean?, I don't understand, what experiences have you had that make you feel that way?

- ✓ Ask about specific past experiences as opposed to current intentions
- ✓ Ask yourself 'to what extent the respondent was able to provide details when asked a probe?'

- ✓ Ask for an example or probe for understanding
- ✓ Remind them in the middle of the interview how different points of view are valuable
- ✓ When irrelevant topics are introduced, guide the conversation back to the target
- ✓ Do not ask a question in several ways, just ask it as you have it on the questionnaire
- ✓ After getting the responses ask: does anyone see it differently?

Ask yourself

- ✓ What else do I need to ask to understand this statement?
- ✓ Am I hearing all I need to answer my RQ?
- ✓ Are the topics discussed addressing the critical areas needed in the study?

At the end of the interview

- ✓ Summarize the main points and ask the participants if that perception is accurate.
- ✓ Turn off the recorder and *then* ask, 'Have we missed anything?'
- ✓ Give the incentive and thank them for the participation
- ✓ Check the recording worked

Immediately after the session

- ✓ Prepare a brief written summary of: key points, first impressions, most important themes, unexpected findings, usefulness of questions and need for revision or adjustment, what wasn't said but was expected.

Appendix 8 – Interview Protocol: Teachers

Name of the school:

School code:

Name of the teacher:

Gender:

Age:

Teacher background

1. How long have you been a teacher?
2. How long have you been teaching 6th grade?
3. Where did you go for your teaching degree (normalista, college, university)?
4. How well, in general, do you feel that the programme prepared you for the challenges you face as a teacher?

Conceptions of learning

5. How do you think children learn?
6. Can you describe a good student?
7. What characteristics of the students concerned you at the beginning of the year?

Learning environment

8. What would you say are the top few challenges that you face as a teacher in your school?

Home–school connections

9. What do you think is the role of parents in their child's schooling?
10. Do you feel, on the whole, that the parents of your students are genuinely interested in their education?

Conception of engagement

11. In your experience, it is true that students learn more when they are engaged?
12. How do you know that a student is engaged?
13. On what subjects is it more difficult to engage students? Why do you think that is the case?
14. What activities do the students seem to enjoy the most? Could you describe a lesson in which you incorporated one of these activities and what was the student response to it?
15. What activities do students seem to enjoy the least and why do you think this is the case?
16. Do you recall any particular classes during your teaching training that focused explicitly on engaging students?
17. What other factors do you consider important for the students to be able to learn?

Atmosphere

18. What do you think the sense of the classroom community should be like, and how do you try to foster it?
19. What do you think is important to consider in creating interest?
20. What do you think is important to consider in keeping students engaged in the content and the activities?
21. What do you think about student choice and control in the classroom?
22. How do you express to students the value of learning?
23. What are your expectations for your students?
24. What do you think about expressing your expectations to students?
25. Do you think providing feedback to the students is important?

26. When do you provide feedback to the students?

Instructional practices

27. Do you connect Mathematics activities with other subjects in the curriculum? Can you give me an example?

28. What are your thoughts about challenging your students?

29. When instructing students, how do you let your students know about the thinking processes involved in a task?

30. The majority of students in your classroom reported in the survey that it is clear to them what they need to do to get a good grade, why do you think that is?

31. The majority of students in your classroom reported in the survey that they have to work hard to do well, why do you think is that?

32. The majority of students in your classroom reported in the survey that you encourage them to consider different solutions or points of view, why do you think is that?

Note: Questions 30 to 32 vary depending on the results of the survey for each school.

Classroom management

33. Briefly describe your routines/schedule for a typical day?

34. What do you think the physical classroom environment should be like?

35. When a student is struggling in your classroom, how do you help them?

36. How would you characterize your behaviour management techniques?

37. Why do you believe that your students are sometimes well behaved/not well behaved?

38. How do you check for understanding in your classroom?

39. What do you think is useful when trying to teach students how to avoid impulsive behaviours in order to fulfill obligations? (e.g. making the choice of completing the homework despite boredom or frustration)

40. Why do you believe that your students are sometimes able to avoid impulsive behaviours to meet goals or finish tasks, and sometimes unable?

Teacher–student relationship

41. Why did you decide to become a teacher?

42. What motivates you to go to work every day?

43. What do your students mean to you?

44. Besides academic factors, what other aspects of your students concerned you at the beginning of the year, and what did you do in this regard?

45. How would you describe your relationship with your students?

46. In general, I can say that these are students living in difficult socioeconomic conditions but that are able to perform at a high level, why do you think this is the case?

Appendix 9 – Interview Protocol: Students

School name:

Group number:

Session number:

Name of the students:

Start time:

End time:

Place where the interview took place:

Overview towards school

1. Do you like to come to school? Why?
2. What don't you like about class work? If you could change anything about class work what would it be?
3. What is the most exciting activity you remember from this school year?
4. What is your greatest goal in life?
5. Do you think that coming to school is important to achieve this goal?
6. Do you think the teacher believes that you can achieve this goal?

Student–teacher relationship

7. What do you like about your teacher?
8. Do you think the teacher worries about students? Why?
9. What does the teacher do when you misbehave?

School experiences

10. Which are the things that help you learn during your classes?
11. Can you come to an agreement on a subject you all like? Why do you like it?

12. Can you describe what happens during this subject?

13. Can you remember a class where you learnt a lot? Tell me about it.

14. What does the teacher do when you don't understand something?

15. Does the teacher make suggestions on how to improve your class work?

Questions to explain further responses from the survey (questions in this section vary according to the responses in each school)

16. Most students in the classroom said in the survey that the teacher frequently relates classroom topics with real life issues, could you give me examples of this?

17. Do you think it is more important to learn things by heart or to think and reflect upon them? Why?

18. Is it more important for the teacher that you learn things by heart or that you think and reflect upon them?

19. What does a student need to do in order to get a good grade?

20. Most students in the classroom said that they have to think a lot in Mathematics class? What do you do in Mathematics class?

21. Does the teacher treat you with respect?

22. Most students in the classroom said in the survey that the teacher encourages them to share ideas on learning topics, how does he encourage you, what does he say?

23. Is there anything else you want to share with me about things that help you learn?

24. Were you as motivated as you are now to come to school in previous years (e.g. in 4th, 5th grade?)

Appendix 10 – Interview Protocol: Head Teachers

Name of the head teacher:

Name of the school:

School code:

Gender:

Age:

1. How long have you been a school principal?
2. Before that, how many years did you work as a teacher?
3. Where did you complete your higher education studies?
4. At school, what elements from the improvement route favour student learning?
5. What technical support activities do you perform as teachers? What sort of tracking do you implement?
6. What is the impact of this on student learning?
7. What strengths do you identify on your teachers' practices?
8. What weaknesses do you identify on your teachers' practices?
9. What difficulties are there on your teachers' continuous training?
10. Do you think that the community supports school efforts aimed at improving children's learning or not?
11. What school programmes do you consider that influence these good academic results?
12. What other school initiatives/strategies influence these good academic results?
13. How do you as a principal influence students' learning?
14. Generally speaking, what we see here are children on marginal conditions who manage to be successful at school. Why do you think this is the case?
15. Why do you think students in this school are so engaged?
16. What are your expectations regarding what students can achieve?

Appendix 11 – Photo: Seating Arrangements for Interview with Students

Appendix 12 – Photo: Incentive for Students Participating in the Interviews

Appendix 13 – Photo: Blackboard with Results from a Reading Test Placed by the Head Teacher in School AI2440

Appendix 14 – Photos: School AI2440

Playground

Computer laboratory

Classroom

Library

Infrastructure in other schools in the sample

Classroom

Restroom

Playground

Library